1-1-2014

Impact of the PEERS intervention on performance-based measures of social skills among adolescents with autism spectrum disorder

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Impact of the PEERS Intervention on Performance-Based Measures of Social Skills among Adolescents with Autism Spectrum Disorder

by

Laura S. Hiruma

A Dissertation

Submitted to the University at Albany, State University of New York

in Partial Fulfillment of

the Requirements for the Degree of

Doctor of Philosophy

College of Arts & Sciences

Department of Psychology

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Impact of the PEERS Intervention on Performance-Based Measures of Social Skills among Adolescents with Autism Spectrum Disorder

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Abstract of a Dissertation

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The present study examines the efficacy of a trial of the Program for the Education and Enrichment of Relational Skills (PEERS; Laugeson & Frankel, 2010), which is a manualized group social skills intervention designed to improve the social functioning of teens with autism spectrum disorder (ASD). Specifically, the study examined the use of performance-based outcome measures (in addition to traditional report measures) to assess the social skills of teens participating in the PEERS intervention. These performance-based measures of social skills included the Social Performance Rating Scale (SPRS; Fydrich, Chambless, Perry, Buergener, & Beazley, 1998), in which observers rated participants’ social and conversation skills during a semi-structured conversation task, and the Faux Pas Recognition Test—Adult Version (Stone, Baron-Cohen, & Knight, 1998), which measures participants’ ability to detect social blunders and understand the perspective of characters presented in different social vignettes. Eleven teens with ASD, ages 12-17, were assigned to either an immediate treatment group (n = 6) or a delayed treatment control (DTC) group (n = 5) matched random assignment. Due to time constraints for the research project, a condensed format of the PEERS intervention (i.e., two 90-minute sessions per week, over seven weeks) was administered to participants. Although results indicated that there were no significant differences in social performance on the SPRS or Faux Pas Recognition Test between conditions, teens in the immediate treatment group demonstrated significantly improved knowledge of social skills compared to the teens in the DTC group. The implications of these findings, the utility of performance-based measures for assessing social skill attainment, and future directions for research are discussed.
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Introduction

Autism spectrum disorder (ASD) is a neurodevelopmental disorder that is characterized by persistent difficulties with social interaction and communication, and restricted and repetitive patterns of behavior, interests, and activities (American Psychiatric Association, 2013). Social deficits, which are a hallmark feature of ASD, include difficulties related to social reciprocity (e.g., responsiveness in social interactions, ability to participate in back-and-forth conversations, ability to initiate social interactions), nonverbal communicative behavior (e.g., appropriate eye contact, accurate interpretation of nonverbal social cues, use of gestures and body language to support communication), and developing, maintaining, and understanding relationships (e.g., engaging with others, demonstrating insight regarding relationships, adapting behavior to relationship context). Unusual repetitive behaviors and highly restricted interests, which are other hallmark features of ASD, also contribute to social difficulties.

For individuals with high-functioning ASD, in particular, social skill impairment is often considered the most detrimental aspect of their functioning (Gantman, Kapp, Orenski, & Laugeson, 2012; Marriage, Gordon, & Brand, 1995). Social difficulties tend to increase for teens on the autism spectrum during the middle school and high school years, as social demands and social interactions become increasingly complicated to master (Gantman et al., 2012; Tantam, 2003). Adolescence also represents a critical time during which social skills must develop for later social and vocational success in adulthood (Howlin & Goode, 1998), further highlighting the urgent need to study effective intervention methods for improving the actual social functioning of teens with ASD. To address this issue, this paper covers the following: (1) specific social
challenges experienced by teens with ASD and the consequences associated with social impairments; (2) previous research related to social skills interventions for individuals with ASD; (3) research evidence for the PEERS intervention; (4) literature regarding the use of performance-based assessments of social skills; (5) the present study’s objectives, design, and results; and (6) discussion of findings and future directions for use of performance-based measures to assess social skill intervention outcomes.

Social Difficulties and Their Consequences among Teens with ASD

Social deficits associated with ASD are known to interfere with the interpersonal relationships and daily functioning of individuals on the autism spectrum (Krasny, Williams, Provencal, & Ozonoff, 2003). There are several specific social skill deficits that have been identified as being common among individuals with ASD. First, definitive characteristics of ASD, such as communication impairments, are likely to make it difficult for individuals with ASD to successfully interact with others. Even among highly verbal individuals with ASD, gaining proficiency in pragmatic social communication skills can be extremely challenging (Stone et al., 1998). Pragmatic language skills can be quite difficult to master, and include the ability to use language for a variety of purposes (e.g., to make requests, engage in chit-chat, share interests, solve conflicts), interpret the meaning of colloquial or non-literal language (e.g., understanding idioms and figurative language), and appreciate the conventions and cultural norms of communication (e.g., modifying language according to the audience, modulating volume depending on context, inhibiting inappropriate comments; Lam & Yeung, 2012). Because of deficits in language pragmatics, individuals on the autism spectrum often experience problems with conversation initiation and have difficulty maintaining
reciprocal exchanges in conversation. Some high-functioning teens with ASD might also exhibit pedantic and verbose styles of speech (Klin & Volkmar, 2003), which can be off-putting to typical same-aged peers. Individuals with ASD also have difficulty appropriately integrating nonverbal behaviors (e.g., eye contact, communicative physical gestures, facial expressiveness, etc.) to support their communication during interactions with others (Attwood, 2000). Additionally, repetitive behaviors associated with ASD may appear strange to others and be socially stigmatizing, while restricted interests may cause individuals with ASD to go off-topic or perseverate on specific subjects in conversation.

Next, individuals with ASD often have poor social awareness and have trouble detecting subtle social cues, such as gestures, sarcasm, and bluffing. They are also prone to misinterpreting social situations due to deficits related to theory of mind and social cognition (e.g., perspective-taking skills, thinking about and interpreting social situations; Baron-Cohen, O’Riordan, Stone, Jones, & Plaisted, 1999; Travis & Sigman, 1998). As a result of these specific difficulties, individuals with ASD often struggle to navigate various social situations, interpret and anticipating the actions of others, and select appropriate social responses. Because individuals with ASD have pervasive social difficulties and often have negative experiences in social interactions, they are more likely to exhibit low motivation to engage in social interactions, initiate fewer social interactions, or avoid social contact (Orsmond, Krauss, & Seltzer, 2004). It is important to note, however, that social withdrawal among individuals with autism may be due to their discomfort or confusion regarding social interactions, rather than a preference to be alone. In many cases, high-functioning individuals with ASD have reported loneliness
and a desire to have more friendships with peers (Marriage et al., 1995; Prior et al., 1998).

For individuals with ASD, social difficulties are often more pronounced in adolescence, as social interactions with peers typically shift from play activities to more advanced conversation skills. Adolescence also represents a time in which social rules and peer interactions become more complex, which may further highlight the social ineptitude of teens with ASD (Tantam, 2003). Due to the high importance placed on social interactions as a part of adolescent daily life, there are a number of consequences for teens with ASD who exhibit significant social impairment. Because teens with ASD have difficulty interacting with peers and exhibit behaviors that may appear “odd” to others, they may face higher risk of peer rejection, social isolation, increased peer conflict, and have poorer quality of friendships (Bauminger & Kasari, 2000; Shtayermman, 2007). Furthermore, social isolation and a lack of peer social support subsequently increase the risk that teens with ASD will stand out as targets for bullying (Humphrey & Lewis, 2008). In one survey of 40 school-aged children with ASD in the United Kingdom, investigators found that students with ASD reported significantly higher frequencies of victimization and significantly lower levels of social support from classmates and friends compared to peers with disordered language (e.g., dyslexia) and typical peers (Humphrey & Symes, 2010). Further analyses from this study demonstrated that receiving social support from classmates was the most important factor for preventing bullying, as higher levels of social support were linked to lower incidences of victimization.
High-functioning teens with ASD also have high risk for social rejection and victimization due to the nature of their disorder and the mainstreamed educational environments in which they typically spend their time. Because ASD can present as a ‘hidden disability’ (i.e., there are no physically-distinct characteristics of autism) and high-functioning individuals often exhibit IQ in the normal range along with adequate verbal language skills, peers might hold higher developmental expectations for these individuals and not attribute odd or challenging behaviors to the presence of a disorder (Attwood, 2000). Additionally, high-functioning teens are often placed in mainstream and inclusive educational environments with typical peers, which can make teens with ASD stand out and increase their exposure to bullying. High-functioning teens with ASD are also more likely to exhibit higher levels of social awareness compared to individuals who are more cognitively impaired, and may be more aware of their own social difficulties and the ways in which peers perceive them (Krasny et al., 2003; Tse, Strulovitch, Tagalakis, Meng, & Fombonne, 2007). This increased social awareness can lead to increased social anxiety, and make social experiences even more negative and aversive (Capps, Sigman, & Yirmiya, 1996).

Finally, social impairments associated with ASD also have important long-term consequences in adulthood, as social skill deficits can lead to problems with romantic relationships, recreational activities, and vocational success—all of which significantly impact an individual’s quality of life (Gantman et al., 2011; Gillis, Callahan, & Romanczyk, 2011; Klin & Volkmar, 2003; Marriage et al., 1995). The way in which social impairments impact the relationships of individuals with ASD has been descriptively analyzed in previous research. One survey of 235 teens and adults with
ASD found that this population reports extremely low levels of peer relationships and friendships (Orsmond et al., 2004). Overall, only 8.1 percent of individuals with ASD in this sample reported a friendship with a same-aged peer that involved reciprocal and varied activities outside of organized settings, 20.9 percent reported having at least one peer relationship that involved some activity outside of a prearranged setting, and 24.3 percent reported having at least one peer friendship in an organized setting. Moreover, 46.4 percent of this sample reported no peer relationships that met any of the previously described criteria. Investigators found that higher-functioning individuals with ASD reported having more friendships than lower-functioning individuals; however, these friendships were often less socially developed than typical friendships and tended to focus on common restricted interests (Church, Alisanski, & Amanullah, 2000). The overall low rate of reported peer friendships among this population is important to note, since close friendships and social supports act as a buffer for adverse life events and serve to increase quality of life (Baxter, 1997). Adolescents who lack close relationships with peers also face higher risk of other mental health disorders, such as anxiety or depression (Buhrmester, 1990). For these reasons, it is important that social skill interventions not only aim to improve the social competency of individuals with ASD, but also improve the number and quality of their friendships with peers.

**Prior Social Skills Intervention Research**

Because of the profound nature of social impairments among individuals with ASD and the risk of negative consequences related to these social difficulties, there is a great need for evidence-based social skills interventions that produce positive and meaningful social outcomes for this particular population. Although though there is a
rather large pool of research related to behavioral interventions designed to intensively
target communication deficits and challenging behaviors among young children with
ASD, there are few evidence-based interventions that target children’s social skills, and
even fewer that target more complex social skills for teens (Piven, Harper, Palmer, &
Arndt, 1996; Weiss & Harris, 2001). There are, however, a small number of promising
interventions that have been reported on within the literature regarding group social skills
interventions for children and adolescents on the autism spectrum. In a comprehensive
review of research in this field (Williams-White, Koenig, & Scahill, 2007), investigators
found fourteen empirical studies in this area that were published between the years 1984
and 2004 (Barnhill, Cook, Tebbenkamp, & Myles, 2002; Barry et al., 2003; Carter et al.,
2004; Cotter, 1997; Marriage et al., 1995; Mesibov, 1984; Mishna & Muskat, 1998;
Ozonoff & Miller, 1995; Provencal, 2003; Solomon, Goodlin-Jones, & Anders, 2004;
Trimarchi, 2004; Webb, Miller, Pierce, Strawser, & Jones, 2004; Williams, 1989; Yang,
Schaller, Huang, Wang, & Tsai, 2003). Common strategies that were applied as part of
group interventions included didactic instruction, modeling of target behaviors, role-
playing, and coaching of skills. Although results from these papers indicated that
improvements in social functioning were observed among many participants, the
reviewers found that these studies generally lacked crucial methods needed to properly
examine treatment efficacy. In fact, there were no studies that included all of the
following important empirical research elements: structured and manual-based curricula,
use of control groups with random assignment, multiple methods of outcome
assessments, and implementation of multi-site randomized control trials. Furthermore,
positive outcomes that were reported among the reviewed studies were primarily based
on anecdotal report, or parent-, teacher-, and self-report measures. Only four of the studies included in the review reported using direct observational assessment of social skills, two of which did not use raters who were blind to the intervention conditions. Although traditional report measures have typically been used to assess social skill intervention outcomes in the past, other research indicates that parent-report may be vulnerable to bias and that individuals with ASD might have difficulty providing accurate self-report due to impairments related to self-awareness and social insight (Johnson, Filliter, & Murphy, 2009).

In another review of research related to social skills interventions for individuals with ASD, Krasny et al. (2003) reached similar conclusions and found that many studies in this area lacked research methods that were adequate for assessing the actual effectiveness of specific interventions. Methods they deemed critical to use included combined use of quantitative and qualitative outcome measures, standardized pre-post testing, use of a randomized control group, examination of generalization of intervention skills, long-term follow-up, replication through multiple treatment trials, and adequate sample size. Other discussions of limitations and important future directions for research in this field have also pointed out that many social skills intervention studies failed to target ecologically valid social skills (i.e., skills that have applicability in real, contemporary social situations), include caregivers in treatment, use instruction methods that are compatible with the learning style of most individuals with autism, or use independent raters who were blind to intervention outcomes (Gresham, Sugai, & Horner, 2001; Laugeson, Frankel, Mogil, & Dillon, 2009; Lord et al., 2005; Rao, Beidel, & Murray, 2008; Reichow & Volkmar, 2010; Rogers, 2000). Furthermore, measures that
assess qualitative improvements in individual’s social interactions and relationships have often been overlooked in previous studies. Finally, because social skills acquisition and generalization pose significant challenges for individuals with ASD (Elder, Caterino, Chao, Shacknai, & De Simone, 2006), researchers have also noted the importance of assessing the durability of treatment outcomes after an intervention has ended through longer term follow-up assessments.

In more recent years, social skills intervention programs for youth with ASD have emerged, which use more stringent research methods to assess outcomes. For example, the Children’s Friendship Training (CFT) is a manualized parent-assisted intervention for elementary-aged children with ASD (Frankel et al., 2010). This program targets important social skills, such as conversation skills, peer entry skills, friendship networking, good sportsmanship, good hosting behaviors, and handling teasing. Investigators of this structured 12-week intervention employed a randomized control group design and found significant improvements on multiple indices of social functioning for children in the CFT group compared to a DTC group. Outcomes were assessed via standardized and descriptive report measures, which included self-report measures of loneliness and self-esteem, and parent-report measures of children’s social skills and quality of play interactions. Other strengths of this study included the provision of caregiver training to supplement the intervention, a large sample size (n=57), and use of independent ratings based on teacher-report of social skills (although no significant social improvements were demonstrated through teacher reports).
Outcome Research for the PEERS Intervention

The Program for the Education and Enrichment of Relational Skills (PEERS; Laugeson, Frankel, Gantman, Dillon, & Mogil, 2012) intervention incorporates skill-building techniques based on those used in the Children’s Friendship Training program, and represents another empirically-based social skills intervention that demonstrates positive outcomes. Created at the University at California, Los Angeles, this program provides teens with ASD, ages 12-17, with small group social skills instruction over the course of fourteen 90-minute sessions. The format of this intervention includes didactic instruction, modeling, role-playing, coaching during behavioral rehearsals, socialization assignments outside of sessions, and caregiver training. The overarching goal of this intervention is to teach teens concrete rules and steps for social interactions that will help them to make and keep friends. Specific social skill targets included in the PEERS intervention were selected to address social difficulties most relevant to teens with ASD, and are considered to be ecologically valid skills. In other words, these skill targets resemble contemporary social behaviors that are likely to help teens become socially successful and accepted by peers. Didactic lessons include the following topics: verbal and nonverbal communication and conversational skills; electronic communication (e.g., etiquette for phone calls, texting, online messaging, emails, and voicemails); identification of relevant peer groups and activities in which to find potential sources of friends; appropriate use of humor and assessing humor feedback from others; group entry and initiation strategies; group exiting strategies; etiquette for hosting successful get-togethers with peers; good sportsmanship; handling teasing; handling bullying; changing bad reputations; resolving arguments with friends; and handling rumors and gossip.
Social cognitive skills are also taught in every session during social role-plays by having participants answer social perspective-taking questions, such as “What do you think that conversation was like for the other person?,” “What do you think the other person thought of their conversation partner?,” and “Do you think the other person would want to talk to their conversation partner in the future?”

Caregiver sessions also occur concurrently with teen sessions and focus on training caregivers to act as social coaches, assisting caregivers with planning of socialization assignments, and troubleshooting any difficulties parents report regarding successful completion of assignments.

Previous research trials have shown this particular social skills intervention program to be effective in terms of outcomes measured via parent and self-report indices of social skills and peer relationships. In an initial research study published by Laugeson and colleagues in 2009, results indicated that individuals who received the PEERS intervention demonstrated significant treatment gains in terms of parent-report of social skills on the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), teen’s performance on the Test of Adolescent Social Skills Knowledge (TASSK; Laugeson & Frankel, 2006), number of hosted get-togethers with peers reported by teens on the Quality of Play Questionnaire (QPQ; Frankel & Mintz, 2011), and teen report on the Friendship Qualities Scale (FQS; Bukowski, Hoza, & Boivin, 1994), compared to individuals assigned to a waitlist condition. For this particular trial, however, no significant improvements were found based on independent ratings on the SSRS teacher-form. This was partly attributed to the low rates of return for this measure compared to the parent and self-report measures that were collected.
Laugeson & colleagues also published another research trial of the PEERS intervention in 2012, and reported similar results in terms of positive treatment outcomes reported via parent and self-report measures for teens participating in the PEERS intervention group. However, this time, investigators found that outcomes were sustained over time, according to data gathered at a 14-week follow-up (Laugeson et al., 2012). The only measure that indicated a loss of gains during follow-up was the social cognition subscale on the SSRS parent-form, although it is possible that this particular measure does not adequately capture participants’ true social cognitive abilities. Furthermore, investigators found significant improvements in social skills as reported on the independently rated teacher-report form of the SSRS at 14-week follow-up. Overall, these findings are impressive, given that traditional social skills report measures are not particularly sensitive in detecting short-term treatment effects (Gresham et al., 2001), which may also help to explain why social improvements were not found on the SSRS teacher-report form until the 14-week follow-up period. However, the investigators for this study noted that there are still limitations to the research design implemented in these trials. One of these limitations included a lack of objective, observational measures of social skills. An additional concern that investigators had involved the loss of social gains related to social cognition skills that were captured on the parent-report form of the SSRS. The authors suggest that future research might include use of behavioral observation measures and further investigate the impact of the PEERS intervention on participants’ social cognitive abilities.
Performance-Based Assessment of Social Skills

Social skills have been defined by researchers as “specific, identifiable skills that result in socially competent behavior” (Hops, 1983) and as “discrete, observable responses that are essential for a child to adapt to and cope with his/her environment” (Matson & Wilkins, 2007). In order for youth to be socially successful, not only should they have knowledge of social skills, but they should also be able to demonstrate these skills when appropriate (Hansen, Nangle, & Ellis, 1996; Sheridan & Walker, 1999). Because social skills are largely defined as behaviors that are used to successfully interact with others, it is important to determine whether social interventions actually create observable changes in social behavior. Furthermore, because social functioning represents a rather complex construct, it is best captured through multi-method approaches of assessment. Since parent and self-report measures are already widely used in social skills intervention research, performance-based measures would offer another valuable mode of assessing treatment outcomes (Hughes et al., 1989; Koenig, De Los Reyes, Cicchetti, Scahill, & Klin, 2009; Warnes, Sheridan, Geske, & Warnes, 2005).

One type of performance-based measure that is commonly used in behavioral research is the role-play test (RPT). Simulated RPTs are typically assessed by coding specific behaviors of interest that are observed during structured or semi-structured interactions. Benefits of RPT assessments include a high degree of practicality in research settings, methodological rigor for administration and coding (compared to naturalistic observation), opportunity to directly observe subtle physical behaviors not readily captured by other modes of assessment, sensitivity to treatment effects, and access to meaningful information regarding participants’ actual behavior repertoires (Bierman &
Welsh, 2000; Harvey, Veligan, & Bellack, 2007). Additionally, RPTs can generally be rated reliably and are considered to provide a powerful methodology for assessing social skills (Bellack, Brown, Thomas-Lohrman, 2006). Furthermore, while naturalistic observation provides a more realistic representation of one’s social functioning, it may not be an ideal method for older children and adolescents, as school observations may be intrusive and fail to capture critical social interactions in close proximity (Hughes, et al., 1989). Still, critics of simulated RPT assessments, note that the methodology and utility of certain RPTs are often questionable. Specific criticisms include use of unrealistic role-play situations (e.g., the use of adult confederates in role-plays), failure to prove criterion-related validity of role-play measures, and less generalizability of conclusions compared to naturalistic observation.

Despite these criticisms, observational and performance-based assessments of social skills have been successfully used with a variety of different populations. In a review of research related to social skills assessments, Matson & Wilkins (2007) found that performance-based measures have been developed for and used with a number of populations, including the following: individuals impacted by schizophrenia and depression (Hersen & Bellack, 1976); unassertive, delinquent, and socially phobic children (Bornsetin, Bellack, & Hersen, 1977; Freedman, Rosenthal, Donahue, Schlundt, & McFall, 1979; Fydrich, Chambless, Perry, Beurgener, & Beazley, 1998; Michelson, DiLorenzo, Calpin, & Ollendick, 1982; Quiggle, Garber, Panak, & Dodge, 1992; Reardon, Hersen, Bellack, & Foley, 1979); and individuals with other severe psychiatric conditions (Matson, Kazdin, & Esveldt-Dawson, 1980). There are very few performance-based assessments, however, that have been developed for use with
individuals with ASD. The Contextual Assessment of Social Skills (CASS; Ratto, Turner-Brown, Rupp, Mesibov, & Penn, 2011) is one role-play measure that has been used with individuals on the autism spectrum; however, this assessment was designed to assess the ability of individuals with Asperger’s syndrome to adapt to changes in social interactions (e.g., during a conversation task, confederates switched between being friendly and open to conversation to being disinterested and passive), has not yet been widely studied, and has not yet been studied as a measure to assess intervention outcomes.

Previous research published on performance-based assessments of social skills emphasizes the importance of observing certain noteworthy social behaviors such as eye contact, appropriate speech content, and tone of voice when observing participants’ social interactions (McFall & Martson, 1970). Conversational social skill targets, such as these, continue to be relevant skills of interest and are captured in measures such as the Social Performance Rating Scale (SPRS; Fydrich et al., 1998). Although the SPRS was developed for use with socially anxious children, it allows for systematic coding of social behaviors that would be important to assess among teens with ASD as well. The SPRS is used to assess individuals’ micro-level behaviors (i.e., gaze, vocal tone, conversation flow, discomfort, and length of response) and has been validated for coding behaviors during social interaction tasks (Stevens et al., 2010). Past studies have used the SPRS to score videotaped observations of individuals during other social tasks, such as short speeches. Raters used a Likert scale to rate participant’s performance within each behavioral domain. The SPRS has demonstrated good inter-rater reliability (.76 - .90) in past research studies (Harb, Eng, Zaider, & Heimberg, 2003; Heiser, Turner, Beidel, &
Roberson-Nay, 2009; Mehl, Rief, Mink, Lullmann, & Lincoln, 2010; Stevens et al., 2010). Furthermore the SPRS has been used to assess the social performance of individuals with social anxiety and schizophrenia-spectrum disorders. Overall, this measure would serve as a valuable addition to the other outcome measures that are currently used to assess the effectiveness of the PEERS intervention.

Performance-based measures have also been used to test individuals’ social cognitive capabilities in past social skills research studies. Social cognition is closely linked to theory of mind (ToM), which is the ability to accurately interpret the behavior of others based on their beliefs, desires, emotions, and intentions. This is considered to be an important skill that underlies one’s ability to engage and succeed in complex social interactions (Leslie, 1987; Mehl, et al., 2010; Stone et al., 1998; Travis & Sigman, 1998). Social cognitive skills, such as ToM, remain a difficult yet important skill domain for teens with ASD to master (Baron-Cohen et al., 1999). Past research suggests that ToM skills are an important predictor for social performance (Mehl et al., 2010). In fact, ToM skills have been found to be more predictive of social performance among individuals with schizophrenia-spectrum disorders than neurocognitive deficits, such as working memory, verbal memory, and attention (Addington & Addington, 2008; Williams et al., 2008). The importance of ToM development for social success further highlights the need for interventions, such as the PEERS intervention, which specifically target social cognitive abilities.

Historically, social cognitive skills have been captured through performance-based measures meant to assess one’s social perspective-taking abilities, such as the Sally-Anne test, which requires that a child interpret and understand a simple interaction
that takes place between two dolls named Sally and Anne (Baron-Cohen, Leslie, & Frith, 1985; Pijnenborg et al., 2009). As part of the Sally-Ann test, a child is asked to observe Sally as she takes a marble and puts it in her basket before leaving the room. While Sally is away, Anne takes the marble out of Sally’s basket and hides it in her own box. When Sally returns, the child is asked, “Where will Sally look for her marble?” In order to demonstrate appropriate perspective-taking abilities, the child should be able to indicate that Sally should believe that the marble is still in her basket even when it is no longer there. Baron-Cohen and colleagues conducted a trial of this test with 61 children with autistic disorder, Down’s syndrome, and children who were neurotypical. Their findings indicated that children with autism struggled significantly with theory of mind skills (20% gave a correct response) compared to children who were neurotypical or had Down’s syndrome (85% gave a correct response).

The Faux Pas Recognition Test (Stone et al., 1998) is another social cognitive test designed to assess more complex ToM skills. Specifically, the Faux Pas Recognition Test assesses an individual’s ability to detect social mistakes and perceive the emotional responses and reaction of characters presented in a series of 20 social vignettes (10 control vignettes and 10 faux pas vignettes). For purposes of this test, the creators defined a faux pas as occurring “when someone says something they should not have said, not knowing or not realizing that they should not say it,” since it likely will insult or hurt others’ feelings. Thus, the vignettes presented in the Faux Pas Recognition Test require participants to detect whether a social mistake has been made or not, understand why a faux pas has occurred, and perceive how it might have made the other character in the story feel. Participants receive a point for their correct responses for each of the
vignettes, resulting in a faux pas recognition score, control story identification score, and a story comprehension score.

In a study conducted by Zalla and collaborators (2009), researchers assessed the performance of individuals with high-functioning autism (HFA)/Asperger’s syndrome (AS) on the Faux Pas Recognition Test. Results from this study indicated that although individuals with HFA/AS are able to detect social rule violations, they struggle to interpret the intent of the actor’s behavior and demonstrated lessened empathic appreciation of the characters’ emotional states in the social vignettes.

Based on its design, the Faux Pas Recognition Test would ultimately serve as a valuable instrument to measure social cognitive abilities more precisely among individuals with ASD who participate in social skills interventions that target ToM skills.

**Current Study Objectives**

Although promising outcomes have been reported for previous 14-week trials of the PEERS intervention, varied formats of this manualized treatment delivered in community settings have not yet been studied. Furthermore, previous research trials of the PEERS intervention have only measured outcomes based on parent, teacher, and self-report measures of social skills. The inclusion of performance-based outcome measures of social functioning would enhance researchers’ ability to assess the actual effectiveness of this intervention in terms of producing meaningful and observable changes in participants’ social behavior. The present study sought to address these issues by conducting a trial of the manualized PEERS group social skills intervention, which included more objective performance-based measures of social skills to assess intervention outcomes. Performance-based measures of social skills, which included the
SPRS and Faux Pas Recognition Test, were used to assess intervention outcomes in addition to traditional self-, teacher-, and parent-report measures that have been used to assess PEERS intervention outcomes in previous studies. More specifically, the SPRS (Fydrich et al., 1998) was used as a performance-based measure of conversation skills, and involved having participants converse with a research confederate during a 5-minute interaction. Interactions were video recorded and later rated by independent observers who were blind to treatment conditions.

Additionally, in the most recently published PEERS intervention study (Laugeson et al., 2012), gains in social cognition as measured by parent-report on the SSRS appeared to be lost at the 14-week follow-up assessment. Since it still remains unclear as to why this was the only treatment gain that was later lost at follow-up, it would be helpful to further assess social cognition among participants. Instead of relying on parent-report alone, the Faux Pas Recognition Test—Adult Version (Stone et al., 1998) designed for adolescents and adults was used to measure participant’s social cognitive skills more directly. This test was designed to assess individuals’ ability to read the intentions and mental states of others (i.e., theory of mind), detect the occurrence of social blunders, and understand the perspectives of characters presented in different social vignettes.

As mentioned before, the proposed PEERS intervention trial also included previously studied outcome measures, which included the parent and teacher-report forms of the Social Skills Improvement System (SSIS; Gresham & Elliott, 2008), self-report Test of Adolescent Social Skills Knowledge—Revised (TASSK-R; Laugeson & Frankel, 2006), parent and self-report forms of the Quality of Socialization Questionnaire
(QPQ; Frankel & Mintz, 2011), and self-report Friendship Qualities Scale (FQS; Bukowski et al., 1994). Secondary outcome measures included the Piers-Harris-Second Edition Self-Concept Scale (Piers, Harris, & Herzberg, 2002), the Social Anxiety Scale—Adolescent Version (La Greca & Lopez, 1998), and Olweus Bullying Scale (Olweus, 2007). These instruments were used to assess the indirect impact of the PEERS intervention on participants’ self-reported self-esteem, levels of social anxiety, and bullying experiences, respectively. Lastly, the proposed study sought to measure the durability of treatment effects by assessing the immediate treatment group participants seven weeks after they had concluded the PEERS intervention. It should be noted that, due to time constraints for the present research study, a condensed trial of the PEERS intervention was conducted in which social skills groups were held twice weekly over 7 weeks, rather than following the manualized format of sessions once weekly over 14 weeks. Furthermore, the intervention was implemented by graduate and undergraduate-level student research staff.

**Hypotheses**

Based on the present study’s objectives and past literature regarding the PEERS intervention, it was hypothesized that participants in the immediate intervention group would demonstrate significant social skill improvements across measures compared to participants in the delayed treatment control (DTC) group. Specifically, it was expected that participants in the immediate treatment group would exhibit improved ratings for social behaviors on the Social Performance Rating Scale (SPRS) and improved levels of social cognition skills measured by the Faux Pas Recognition Test—Adult Version compared to individuals in the DTC group. Additionally, it was hypothesized that
participants in the immediate treatment group would show greater mean improvements across teacher, parent, and self-report measures of social skills, peer relationships, and participant characteristics (e.g., anxiety, bullying experience, self-esteem); higher levels of self-esteem, and lower levels of social anxiety on self-report measures post-intervention. Lastly, treatment gains made by participants in the immediate treatment group were expected to be maintained across measures at a seven-week follow-up.
Method

Participants

Participants for the present study were recruited through research advertisements distributed to local ASD service providers by the Center for Autism and Related Disabilities (CARD) at the University at Albany, State University of New York, and through research advertisements posted on the CARD website (see Appendix A for recruitment flyer). Prior to enrollment in the study, parents and teens were provided information regarding the PEERS intervention and were given the opportunity to ask questions regarding the research program. Parent consent and teen assent were obtained for individuals who elected to participate in baseline and screening assessments and who wished to participate in the PEERS group (see Appendix A for parent consent and teen assent forms). Next, participants were screened for ASD traits, cognitive ability, adaptive skills, and social difficulties using the adolescent version of the Autism Spectrum Quotient (AQ; Baron-Cohen, Hoekstra, Knickmeyer, & Wheelwright, 2006), the Kaufman Brief Intelligence Test—Second Edition (KBIT-2; Kaufman & Kaufman, 2005), the Vineland Adaptive Behavior Scales—Second Edition (Vineland-II; Sparrow, Cicchetti, & Balla, 2005) and a brief clinical interview, respectively (see Appendix B for screening measures). Inclusion criteria for the study required that participants: (1) be previously diagnosed with ASD, Asperger’s Syndrome, or Pervasive Developmental Disorder—Not Otherwise Specified (medical diagnoses were verified based on documentation provided by participants’ parents, and current ASD symptoms were assessed using the adolescent version of the AQ); (2) be between the ages of 12-17 years old; (3) demonstrate composite IQ scores within the normal range on the Kaufman Brief
Intelligence Test—Second Edition (KBIT-2) to ensure that they would benefit from the particular didactic format of the PEERS intervention; (4) report social difficulties as a primary area of concern; (5) have a caregiver who was willing to participate in the study; and (6) be willing and able to attend sessions held on Monday and Thursday evenings over seven weeks. All included participants received the intervention at no cost and could choose to withdraw from the study at any time, although no participants elected to withdraw. Participants who were deemed ineligible for the research study were provided with other resources and information regarding local social intervention programs and social support groups in the area.

Eleven male teens, ages 12-17 years (M=14.1, SD=1.66), met inclusion criteria and participated in the research study. Ten participants identified as being Caucasian and one participant identified as being African American. In terms of participants’ current school placements, eight teens were in general education programs, two teens were participating in partially mainstreamed programs, and one teen had withdrawn from school in order to pursue a general education development (GED) degree. Each of the eleven participants’ mothers participated in the caregiver group. While all participants demonstrated cognitive abilities in the average range (mean KBIT-2 composite IQ was 96.5 for the immediate treatment group and 103.2 for the DTC group), many of the participants demonstrated adaptive skills in the low range (mean Vineland-II composite score was 74.0 for the immediate treatment group and 76.0 for the DTC group). Table 1 displays demographic data for the immediate treatment and DTC groups. There were no significant differences on baseline and screening measures between groups, including IQ, with all p-values > .11.
Procedure

Following baseline screening and assessment, a matched random assignment procedure was used to ensure that the immediate treatment and DTC groups had a comparable number of participants with similarly distributed ages. As part of this procedure, the eleven teenaged males who were enrolled in the study were matched into pairs with a same-aged peer (with the exception of one participant who was randomly assigned on his own due to an uneven number of participants), where one individual was randomly assigned to one of the two group conditions and his matched peer was then assigned to the other group. Six teens were assigned to the immediate treatment group and five teens were assigned to the DTC group. The DTC group was placed on a seven-week waitlist before beginning the PEERS intervention. Individuals in the waitlist group did not participate in any other interventions while waiting to begin the PEERS intervention. Individuals assigned to the DTC condition were assessed once more prior to beginning the PEERS intervention seven weeks later, so that their data could be compared to individuals in the immediate treatment group who had completed the social skills intervention.

Teens and caregivers attended separate concurrent sessions at CARD, which were each led by a doctoral-level graduate student in clinical psychology. Research assistants, who were either graduate or undergraduate psychology or school psychology students, also assisted with sessions, by leading role-playing demonstrations, providing social coaching to teens during behavioral exercises, monitoring treatment fidelity, and helping teen and parent dyads with planning of socialization assignments. In order to provide
teens with sufficient support and coaching during sessions, there were typically 3 research staff members assisting with each of the teen sessions.

The PEERS treatment was conducted in the manner outlined in the intervention manual (Laugeson & Frankel, 2010), with the exception that group sessions took place over fourteen, 90-minute sessions held twice weekly (on Monday and Thursday evenings), rather than once per week due to time constraints for completion of the research project. The PEERS intervention was conducted in a small group format with concurrent teen and caregiver sessions, and targeted the following social skills: conversational skills, group entry and exiting skills, developing friendship networks, good sportsmanship, good host behavior during get-togethers, changing bad reputations, and handling teasing, bullying, and arguments. As previously mentioned, the PEERS program uses evidence-based methods of instruction to teach the social skills curriculum, involving strategies which include a Socratic method of introducing skill targets (so as to actively engage participants in discovery and discussion of social rules), didactic instruction, modeling through social role-plays conducted by behavioral coaches, and behavioral rehearsal and coaching of skills with other participants in session. Additionally, The PEERS intervention addresses social cognition skills by posing perspective-taking questions to adolescents during social role-play scenarios so that participants can begin to develop an understanding of how certain social behaviors affect other people. Participating teens were also rewarded with points during each session in order to encourage participation and attention during lessons. At the end of the program, the order in which teens selected program graduation prizes depended on the number of
points they had received. Prizes that participants earned at the end of the program were designed to be used as social activities (e.g., board games, sports equipment, etc.).

Time during caregiver sessions was used to review social homework assignments, train caregivers to act as social coaches to their teens, and troubleshoot difficulties that families might be having with the socialization practice assignments. Additionally, the last portion of every session was spent with both teens and their caregivers together to allow time for parent-teen dyads to negotiate when and how social homework assignments would be completed outside of session. Treatment fidelity was monitored for every session by having research staff refer to PEERS curriculum checklists during each session to ensure that all elements of the intervention were provided according to the PEERS manual with 100 percent fidelity.

Data gathered through performance-based measures, knowledge tests, report measures, and secondary measures were given at baseline/Time 1, post-treatment for the immediate treatment group/Time 2, and at a seven-week follow-up/Time 3. Although efforts were made to remind and encourage participants to return to the research site for assessments at later time points (i.e., email and phone messages were made to each participating caregiver to remind them of testing appointments), some participants did not return for testing at Time 3 and/or did not return completed report measures. For this reason, there was missing teen and parent data for this sample. Teachers were also provided with a small incentive (i.e., gift card) upon receipt of their follow-up data in order to encourage higher rates of return; however, there were missing teacher data as well. T-tests were used to assess equivalence between the immediate treatment group and the DTC based on demographic variables and baseline/Time 1 measures. Similar to
the methods used in the PEERS trial conducted by Laugeson, Frankel, Mogil, and Dillon (2009), mixed MANOVA procedures were used assess outcome variables between groups across time points.

Screening Measures

Kaufman Brief Intelligence Test—Second Edition (KBIT-2; Kaufman & Kaufman, 2005). Because the study’s inclusion criteria required that participants demonstrate cognitive functioning in the average range of intelligence, the KBIT-2 was used as a screening instrument to measure individual’s intellectual functioning prior to their enrollment in the treatment program. The KBIT-2 is a brief cognitive assessment that takes approximately 25 minutes to administer, and measures cognitive functioning in verbal and nonverbal domains. Verbal, nonverbal, and composite IQ scores have a mean of 100 and a standard deviation of 15. The KBIT-2 intelligence quotient cut-off score for the average range of intellectual functioning (IQ > 85) was used as part of criteria to determine whether an individual meets the program’s eligibility requirements. This instrument demonstrates good convergent validity with numerous validated intelligence tests, including the Wechsler Intelligence Test for Children-Fourth Edition (WISC-IV; Wechsler, 2003).

Autism Quotient—Adolescent Version (AQ-A; Baron-Cohen et al., 2006). The AQ-A is a brief 50-item parent-report measure that was developed to quickly and easily screen individuals for autistic traits. Respondents are asked to indicate their level of agreement to statements describing different behaviors and characteristics by selecting one of the following responses: “definitely agree,” “slightly agree,” “slightly disagree,” or “definitely disagree.” For statements that refer to autism-related characteristics, such
as “s/he prefers to do things the same way over and over again,” one point is scored for “definitely agree” or “slightly agree” responses. For normative behavior statements, such as “s/he enjoys social chit-chat,” one point is scored for “slightly disagree” or “definitely disagree” responses. A summed score of 26 or more is considered to be possibly predictive of an ASD, and a summed score of 32 or more is considered to be highly predictive of an ASD. The AQ-A is reported to be highly sensitive in detecting autistic traits and is strongly predictive of clinic-based diagnosis of AS. This screening tool demonstrates adequate internal consistency (.82) and test-retest reliability (.70). The AQ-A was administered to teen’s caregivers at baseline/Time 1 to assess parent-reported autism-related symptoms. This measure was not used for diagnostic purposes, but rather to confirm presence of ASD-related symptomatology. Inclusion criteria for the present study required that each participant’s score exceed the 26-point cut-off.

*Vineland Adaptive Behavior Scales—Second Edition, Survey Form (Vineland-II; Sparrow et al., 2005)*. Participants’ level of adaptive skills related to overall functioning, communication, and socialization were screened at baseline (to assess the equivalency in adaptive skills between the two groups) using the Vineland-II. This parent-report measure takes approximately 30 minutes to complete and assesses child and adolescent functioning within a variety of skill domains, which include communication, daily living skills, socialization, and motor skills. The Vineland-II produces standard scores with a mean of 100 and a standard deviation of 15. This measure shows good reliability for both domain and composite scores (.80-.95).
Performance-Based Measures

*Social Performance Rating Scale (SPRS; Fydrich et al., 1998).* The SPRS is an observation rating scale that has been used to assess individual’s social performance during a variety of interactions (e.g., conversation task, public speech). An initial study conducted by Fydrich and colleagues (1998) assessed the psychometric properties of the SPRS and examined its use among socially phobic, anxious, and typical individuals. For each of these populations, there was good inter-rater reliability for individual items and total score on the SPRS (r = .76 to .90). Furthermore, the summed ratings across the five performance targets demonstrate high internal consistency for total social performance (alpha = .72). For this reason, the summed total score on the SPRS is often used to assess participant’s social performance, rather than scores on individual items. For the present study, a slightly modified version of the SPRS was used to assess participants’ social and conversational skills during a video-recorded conversation with a research confederate (trained undergraduate researchers). The only modification on the SPRS rating form included more precise descriptions of specific micro-behaviors that were considered to be relevant to a population of teens with ASD. The modified SPRS rating form was to assess participants’ social skills performance during a semi-structured conversation task. It was decided that conversation skills would be an important area to assess, as conversation skills are critical for teenagers’ success in social interactions (Hops, Alpert, & Davis, 1997). For this task, participants were seated in a waiting area with a young adult, who was an undergraduate research confederate. Participants were told that they should strike up a conversation with the other person to get to know each other while they are waiting (during a 5-minute period). Because participants’ performance during this
semi-structured interaction could have been affected by the confederate’s behavior (DiLorenzo et al., 1990), research confederates were trained to use standardized conversation prompts and response sets, and to remain relatively neutral and passive, yet open to conversation during the interaction period (see Appendix C for conversation task outline and guidelines). The research confederates used in the study included five female undergraduate and graduate-level research assistants. To ensure that participants did not become more familiar with confederates during later observations, different confederates were used with each participant for each conversation task. Similar to a performance-based task used in a study conducted by Bierman & Furman (1984), research confederates were trained to provide natural conversation prompts to participants, such as self-disclosures (e.g., “I saw a really great movie last night”) and questions or leads, (e.g., “Do you have any plans for the weekend?; What kind of music do you listen to?”).

Conversation task confederates varied for each of the participants (based on research staff’s availability to attend participants’ assessment appointments). A different confederate was also intentionally used for each participant for each assessment time point to ensure that participants’ performance during the conversation task was not a function of their familiarity or comfort level with a given research confederate.

Video recordings of participants’ social performance during the 5-minute interactions were rated by two trained independent observers (psychology students with some clinical experience related to ASD). Videos were presented to observers in random order to ensure that they were blind to the participants’ treatment conditions. Observers provided rating for five areas on the SPRS, which included eye gaze, vocal quality, speech length, level of apparent discomfort, and conversation flow. Ratings on the SPRS
are administered along a five-point scale that described criteria for specific social performance targets (see Appendix C for copy of SPRS rating form). Low scores on the SPRS are indicative of poor social performance, whereas a high score is indicative of solid social performance. For example, for eye gaze, ratings ranged from (1) “very poor: participant completely avoids looking at the partner or stares continually,” (2) “poor: participant avoids eye contact (or stares) for majority of time/disruptive to performance,” (3) “fair: participant frequently avoids eye contact (or stares)/gaze pattern is mildly disruptive to performance,” (4) “good: participant occasionally avoids eye contact or tends to look too much (stares) while partner is speaking or during shifts in conversation,” and (5) “very good: participant keeps eye contact during conversation, does not stare/shifts focus during pauses and conversation.” For each participant’s overall social performance score, both raters integrated their individual ratings across domains to create consensus ratings. The reliability of independent observer ratings across SPRS domains ranged from .65 to .85.

Faux Pas Recognition Test—Adult Version (Gregory et al., 2002; Stone et al., 1998). Subjects’ social cognitive abilities were measured by having them respond to questions about different social vignettes from the Faux Pas Recognition Test—Adult Version. This measure was adapted from the original child version, which was created to test more complex theory of mind (i.e., social perspective-taking abilities) skills among children, 7-11 years old (Baron-Cohen et al., 1999). The test is meant to capture one’s ability to detect social blunders and understand the emotions and perspectives of characters presented in the different vignettes. It was designed based on the assumption that in order to detect a social faux pas one must understand that one person in a situation
is unaware or has a mistaken belief that leads to the social mistake, and have the empathic understanding about the kinds of things someone would find insulting or upsetting in a situation. The original Faux Pas Recognition Test—Adult measure contains 20 vignettes, each followed by a set series of questions. Ten of the vignettes contain social mistakes of some kind, while the other ten control stories did not. In order to assess participants’ faux pas recognition skills at baseline/Time 1 and post-intervention/Time 2, two short versions of the Faux Pas Recognition Test—Adult Version were used. Each form contained five stories that described a socially embarrassing or awkward situation, and five control stories that described neutral situations (see Appendix C for copy of Faux Recognition Test).

Vignettes were read aloud to participants to ensure that performance on the test was not a function of participants’ reading comprehension abilities. Additionally, participants were given a typed copy of each story so that they could refer back to the story when questions were asked without having to rely on their memory. After hearing each of the stories, participants were asked if someone in the story made a social mistake, and to guess how the other character in the story may have felt as a result. For example, each of the vignettes is followed by questions such as:

1. Did someone say something they shouldn’t have said or something awkward?
   (continue if subject responds, “Yes”).

2. Who said something they shouldn’t have said or something awkward?

3. Why shouldn’t he/she have said it or why was it awkward?

4. Why do you think he/she said it?
5. Did Sarah remember that the party was a surprise party (as an example control question that asks about a detail of the vignette)?

6. How do you think Jill felt?

Participants were given one point for each correct answer they provided for the vignette questions, resulting in a faux pas/control detection score (Detection), identifying inappropriateness score (Identification), understanding intentions score (Intentions), false belief score (Belief), empathy score (Empathy), and story comprehension score (Comprehension).

**Knowledge Measure**

*Test of Adolescent Social Skills Knowledge—Revised (TASSK-R; Laugeson & Frankel, 2006).* The TASSK-R is a 26-item criterion-referenced measure specifically developed to measure knowledge of skills taught during the PEERS intervention. The multiple-choice test takes approximately five minutes to complete. The TASSK-R is an updated version of the original TASSK (Laugeson et al., 2009), which demonstrated sensitivity to treatment effects and had a moderate level of internal consistency (coefficient alpha of 0.56). The TASSK-R was administered to teens at each of the three assessment periods to assess their specific knowledge of social skills. Scores are reported as percentage of correct responses on the TASSK-R (see Appendix D for copy of TASSK-R).

**Report Measures**

*Social Skills Improvement System (SSIS, Gresham & Elliott, 2008).* The SSIS is an updated version of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990), which includes a 79-item parent form and teacher form that assess children’s and
adolescent’s social skills and competing problem behaviors. Social skills that are evaluated through this tool include communication, cooperation, assertion, responsibility, empathy, engagement, and self-control. Competing problems of interest include externalizing behaviors, bullying, hyperactivity and inattention, internalizing behavior, and autism spectrum traits. This measure requires respondents to rate the frequency of social and behavioral items as “never,” “seldom,” “often,” and “almost always.” For items in the social skills domain, respondents must also indicate how important the social behavior item is for the success of the individual’s development by selecting “not important,” “important,” or “critical.” The SSIS takes approximately 15 minutes to complete, and produces composite social skills scale scores and problem behaviors scale scores with a mean of 100 and a standard deviation of 15. In addition to administration of the parent form, the teacher form of the SSIS was sent to participants’ teachers in order to obtain outside reporting regarding participants’ social functioning at school (see Appendix D for copy of SSIS parent and teacher forms).

*The Quality of Socialization Questionnaire (QSQ: Adapted from Frankel et al., 2010).* The QSQ adolescent and parent forms are measures adapted from the Quality of Play Questionnaire (Frankel et al., 2010). The adolescent and parent measures each contain two items that ask about the frequency of hosted and invited get-togethers with peers that teens have had over the previous month, as well as 12 items that assess the level of conflict that occurred during get-togethers. For the conflict scale, respondents are asked to indicate whether statements such as, “We got upset at each other,” are “Not at all true,” “Just a little true,” “Pretty much true,” or “Very much true.” Measures of this kind have been used in prior PEERS evaluation studies (Laugeson et al., 2012) to assess
the impact of the social skills intervention on frequency and quality of peer get-togethers, and have shown that teens participating in the PEERS intervention reported having a significantly higher number of hosted get-togethers with peers compared to teens in a DTC group. The QSQ was administered to caregivers and teens at each of the three assessment periods to assess the frequency and quality of peer get-togethers for each condition (see Appendix D for copy of QSQ parent and adolescent forms).

*Friendship Qualities Scale (FQS; Bukowski et al., 1994).* The FQS, which is a self-report measure of friendship quality, was administered to participants to assess their perceived quality of friendship with a best friend. The FQS contains 23 yes/no items that asks teens to indicate how true a statement about a best friend is, such as “my friend and I spend all our free time together,” on a 5-point Likert scale that ranges from (1) “Not true,” (2) “A little true,” (3) “Somewhat true,” (4) “Mostly true,” and (5) “Really true.” In addition to a total score, the FQS consists of five subscales, which include Companionship, Closeness, Help, Security, and Conflict. According to the scale’s authors, coefficient alphas for the subscales range from .71 to .86 (see Appendix D for copy of FQS).

**Secondary Outcome Measures**

*Olweus Bullying Questionnaire (Olweus, 2007).* The parent and teacher forms of the Olweus were used to assess the occurrence, frequency, and types of bullying and victimization that participants experienced. The parent and teacher forms of this measure both include sixteen questions that take approximately five minutes to complete. The youth self-report version includes 40 questions that take approximately fifteen minutes to complete. While the main goal of the PEERS intervention is not to reduce the occurrence
of bullying, it is possible that the intervention may indirectly decrease the degree to which participants are victimized should they experience positive outcomes in terms of increased social competency. The PEERS intervention also teaches skills specific to handling peer conflict which may help participants address any ongoing occurrences of bullying. Additionally, measures, such as the Olweus Bullying Scale, provide useful information regarding the prevalence of bullying and victimization among the participating sample of teens with ASD (see Appendix E for copy of Olweus Bullying Questionnaire parent and teacher forms).

*Piers-Harris Self-Concept Scale, Second Edition (Piers-Harris-2; Piers et al., 2002).* The Piers-Harris-2 was used to assess participants’ perceived sense of self-esteem. The self-report scale contains 60 statements, such as “It’s difficult for me to make friends,” to which adolescents are asked to mark a “yes” or “no” answer. The Piers-Harris-2 yields a Total self-concept score along with six subdomain scale scores in Behavioral Adjustment (BEH; 14 items regarding problematic behaviors), Intellectual and School Status (INT; 16 items regarding youth’s evaluation of their own intellectual and academic abilities), Physical Appearance and Attributes (PHY; 11 items regarding youth’s appraisals of their own physical appearance and personality attributes), Freedom from Anxiety (FRE; 14 items regarding anxiety and dysphoric mood), Popularity (POP; 12 items regarding youth’s evaluation of their own social functioning), and Happiness and Satisfaction (HAP; 10 items regarding feelings of happiness and life satisfaction). An analysis of the measure’s internal consistency (Piers et al., 2002) yielded the following Cronbach’s alpha values: Total scale=.92; BEH scale=.81; INT scale=.81; PHY
scale=.75; FRE scale=.81; POP scale=.74; and HAP scale=.77 (see Appendix E for copy of Piers-Harris 2 form).

*Social Anxiety Scale-Adolescent Version (SAS-A; La Greca & Lopez, 1998).* The adolescent and parent forms of the SAS-A were used to assess participants’ levels of social anxiety. Although, the PEERS intervention does not directly target social anxiety, the addition of this secondary measure was meant to access information regarding the way in which anxiety might fluctuate for participants pre- to post-treatment. Additionally, socialization assignments (in which teens host supervised get-togethers with peers) might also provide extra exposure to social situations and inadvertently decrease social anxiety. The adolescent and parent forms of the SAS-A each contain 22 items that ask teens and parents to indicate how true a given statement is, such as “I/my child worry/worries about what other people think about me,” on a 5-point Likert scale that ranges from “Not at all true,” “Hardly ever true,” “Sometimes true,” “Most of the time true,” and “True all of the time.” In addition to a total score, the SAS-A consists of three subscales, which include Fear of Negative Evaluation (FNE), Social Avoidance and Distress in New Situations (SAD-New), and Social Avoidance and Distress-General (SAD-General). The scale’s authors report that the SAS-A has adequate internal consistency (Cronbach’s alpha > .70) and test-retest reliability (.54-.78 on subscales; see Appendix E for copy of SAS-A form).
Results

T-tests indicated that there were no significant differences in demographic variables or baseline measures between groups at the baseline/Time 1 assessment phase (p-values > .11), suggesting that the two randomly matched groups were equivalent in terms of age, grade level, gender, KBIT-2 IQ scores, and baseline skills (see Table 1). Given that the goal of the present study was to compare social skills outcomes between the immediate treatment and DTC groups across three time points (e.g., baseline/Time 1, post-intervention for the immediate treatment group/Time 2, and seven-week follow-up/Time 3), a mixed MANOVA method for analyzing repeated measures (O’Brien & Kaiser, 1985) was initially used to analyze the data and assess treatment outcomes by assessing the significance of Condition (immediate treatment versus DTC) X Time (for the three assessment time points) interactions. However, multiple data points were missing for Time 3, as some participants did not return to the research site to complete performance-based measures or return other assessments following completion of the intervention. Due to the study’s small sample size and a large amount of missing data at Time 3, the initial analyses failed to detect any significant interactions. Thus, a mixed MANOVA approach was used to assess participants over two time points instead (i.e., baseline/Time 1 and post-treatment/Time 2), which was analogous to the procedure used by Laugeson, Frankel, Mogil, and Dillon in a similar PEERS trial study design (2009). This procedure was deemed to be appropriate due to the large number of outcome measures used and moderate amount of missing data.

For the following results, df < 9 indicate that data was missing from the analyses. Findings revealed significant Condition X Time (Time 1 to Time 2) interactions for
teens’ scores on the Test of Adolescent Social Skills Knowledge—Revised ($F_{(1, 9)} = 9.83$, $p = .012$, $\eta^2 = .522$), Quality of Socialization Questionnaire parent-reported get-togethers hosted by teens ($F_{(1, 8)} = 5.63$, $p = .045$, $\eta^2 = .413$), and Social Anxiety Scale—Adolescent Version parent-reported social anxiety scores ($F_{(1, 9)} = 6.22$, $p = .034$, $\eta^2 = .409$). Figures 1, 2, and 3 display the mean scores for these three measures for the immediate treatment group and DTC group over the duration of the study. Post-hoc univariate analyses revealed a significant main effect comparing scores on the Test of Adolescent Social Skills Knowledge—Revised between the treatment and DTC groups ($F_{(1, 9)} = 8.68$, $p = .016$, $\eta^2 = .491$), indicating that participants in the immediate treatment group scored significantly higher post-treatment compared to individuals in the DTC group. However, there were no significant main effects for parent-reported hosted get-togethers on the Quality of Socialization Questionnaire ($F_{(1, 8)} = 3.58$, $p = .095$, $\eta^2 = .309$) or scores on the Social Anxiety Scale—Adolescent Version parent form ($p = .383$) between groups, indicating that differences in these measures over time could not be attributed to participants’ treatment condition alone. Overall, teen performance on the Test of Adolescent Social Skills Knowledge—Revised was the only outcome measure to demonstrate a significant effect in terms of treatment.

In regards to the performance-based measures used to assess participants’ social skills, there was no significant effect of the intervention on participants’ observed social performance for the Social Performance Rating Scale conversation task ($F_{(1, 9)} = .015$, $p = .907$), nor was there a significant effect of the intervention on participants’ ability to correctly detect and interpret social blunders on the Faux Pas Recognition Test ($F_{(1, 8)} = .008$, $p = .932$). A correlational analysis of inter-rater reliability was conducted for the
Social Performance Rating Scale, since each participant’s performance during the conversation task was rated by two different blind observers. Inter-rater reliability (Chronbach’s alpha) for the six scales were as follows: Gaze = .71, Vocal quality = .85; Length of responses = .80; Discomfort = .65; Conversation flow = .76; and Total score = .84. Overall, these values indicate that there was adequate inter-rater reliability between observers across scoring domains on the Social Performance Rating Scale, as values above .70 are generally considered to be adequate as a consistency estimate in this type of research design (Multon, 2012).

MANOVA analysis failed to reach significance for all other parent and self-report measures that were administered, which included the Social Skills Improvement System parent form, Quality of Socialization Questionnaire adolescent form, Friendship Qualities Scale, Olweus Bullying Questionnaire parent and teacher-report forms, Piers-Harris Self-Concept Scale, Second Edition, and Social Anxiety Scale—Adolescent Version adolescent form. Additionally, there were no significant findings related to teacher outcome variables, likely due to the study’s small sample size and low return rates of completed teacher measures. Tables 2, 3, and 4 show mean outcome measures for the immediate treatment group and DTC group from Time 1 to Time 2 for teen assessments, parent measures, and teacher measures, respectively.
Discussion

The primary goal of the present study was to assess the impact of a trial of the PEERS social skills intervention on the social performance and social cognitive abilities of teens with ASD. A secondary goal was to replicate the successful findings discovered by Laugeson and colleagues (Laugeson et al., 2012; Laugeson & Frankel, 2010; Laugeson et al., 2009) in terms of significant improvements found among self, parent, and teacher-report outcome measures of social skills, friendship quality, and frequency of get-togethers with peers among teens with ASD who participated in the PEERS intervention.

The PEERS intervention represents one of the most promising social skills treatments for youth with ASD given its tailored method of instruction, ecologically valid social skills targets, incorporation of parent training, and use of socialization assignments to generalize skills and encourage teens to build peer relationships. Similar to past research trials of the PEERS intervention, the present study followed many of the recommended research guidelines for assessing a social skills intervention, which included use of a randomized waitlist control group, inclusion of third-party (blind rater) data from teachers, and collection of data at longer-term follow-up post-intervention to assess durability of any treatment effects (Gresham et al., 2001; Laugeson et al., 2009; Lord et al., 2005; Rao et al., 2008; Reichow & Volkmar, 2010; Rogers, 2000). A major strength of the present study that goes beyond the methods used in past research trials of the PEERS intervention, is the inclusion of more objective performance-based measures of social skills and social cognitive abilities, which were the Social Performance Rating Scale conversation task (coded by blind observers) and the Faux Pas Recognition Test.
Laugeson and colleagues had pointed out the need for more behaviorally-based assessment in their 2012 study, stating that, “Given the fact that parents are active participants in the [PEERS] intervention and might be susceptible to bias, additional third party assessments…and behavioral observations would be beneficial toward establishing the validity of findings” (pg. 1034). Thus, the use of performance-based measures of social skills is an important research component that should be included in all intervention research meant to improve participants’ social skills.

Similar to past PEERS research studies, results of the present PEERS trial indicated that teens in the immediate treatment group demonstrated significantly improved knowledge of social skills compared to teens in the DTC group. Although findings support the effectiveness of the PEERS intervention for increasing teen’s knowledge of social skills, it is important to clarify that improvements associated with the Test of Adolescent Social Skills Knowledge—Revised only indicate that participants in the PEERS intervention were able to correctly identify the PEERS social skills rules/targets that they were intended to learn, and does not provide any indication that teens are actually using these skills or improving their relationships with peers out in the real world. Additionally, results of the present study did not support the main research hypothesis that the present trial of the PEERS intervention would produce significant improvements in observable social skills performance among study participants. There were no significant findings regarding the specific performance-based outcome measures of interest, which included the Social Performance Rating Scale and Faux Pas Recognition Test. This suggests that, for this particular small-scale PEERS trial, the intervention did not appear to impact the actual social performance or social cognitive
abilities of teens with ASD who participated in the program. Furthermore, there were no significant findings regarding the effect of the PEERS intervention on any of the parent, teacher, and self-report measures of social skills and quality of friendships that have been used by researchers to assess the effectiveness of the PEERS intervention in past research trials, nor were there any significant findings regarding treatment effects on additional report measures that were included in the present study (i.e., Olweus Bullying Scale, Social Anxiety Scale—Adolescent Version). Given the small sample size included in the present study and missing data for some participants, it is likely that the present study was not able to detect group differences and treatment effects as well as larger past research trials of the PEERS intervention. There were, however, significant Condition x Time interactions found related to parent-reported teen hosted get-togethers with peers on the Quality of Socialization Questionnaire and parent-reported teen anxiety symptoms on the Social Anxiety Scale—Adolescent Version. Although analyses revealed that there was no significant effect of treatment on these measures alone, further inspection of graphical data (see Figure 2) indicates that the number of parent-reported teen hosted get-togethers with peers did show some increase for both groups following their participation in the PEERS intervention. The increase in reported hosted get-togethers with peers was also sustained by the immediate treatment group at seven-week follow-up (which indicates that the increase in get-togethers for the immediate treatment group was not purely a function of teens simply completing the required PEERS socialization assignments).

The present study’s results contrast somewhat with those found in previous PEERS intervention studies (Laugeson et al., 2012), in which investigators reported
several significant findings related to increased self-reported teen hosted get-togethers with peers, social skills improvements reported on parent-report measures, and increased self-reported friendship quality. There are several explanations to account for these differences in findings, which also relate to the present study’s limitations. First, the present study included a very small sample of teens with ASD due to natural time constraints for the study recruitment process. Because only eleven teens participated in the research program, it is likely that the study design was underpowered making it difficult to yield significant results. However, significant findings for the present study related to teen knowledge of the PEERS curriculum are quite impressive given the small scale of the research trial. It is also important to note that the present study examined a condensed format of the manualized PEERS intervention, which took place over 7 weeks (with 2 weekly session) instead of the recommended 14 weeks (with one weekly session) due to time constraints for the completion of the research project. Although all of the PEERS curriculum outlined in the manual was reviewed over the course of 7 weeks, it is possible that the closely spaced sessions allowed less time for each skill to be practiced before moving on to the next lesson, and less time to complete the recommended number of socialization assignments. Similar to difficulties reported as part of past PEERS research trials, the limited number of teachers who completed pre- and post-intervention measures for the present study likely contributed to the lack of significant results among the teacher-reported outcome measures. In future studies, it will be important to collaborate more (i.e., through more personal phone contact, etc.) with school staff who might serve as third-part informants regarding youth’s social performance at school. Additionally, given the high prevalence of ASD among males, the present study’s sample
was comprised of only male participants. In the future, it would be beneficial to recruit more female participants in order to study the specific effects of the PEERS intervention on the social skills of males versus females with ASD, given that ASD-related social and communication difficulties typically present differently between genders (Nichols, Moravcik, & Tetenbaum, 2009).

Because one’s social performance dictates one’s social reputation, peer acceptance, and relationship success (Gresham & Elliott, 1984; Rose-Kraznor, 1997), it is supremely important to assess the impact of social skills interventions on the actual social performance of individuals with ASD. Although there were no significant findings related to the performance-based measures included in this study, the use of such measures in social skills intervention research is still important. The Social Performance Rating Scale demonstrates adequate inter-rater reliability, which might be improved with more intensive observer training, and is a helpful tool that allows observers to rate micro-level social behaviors of interest. The social validity of performance-based measures used to assess social skills might be improved in future studies by having same-aged peers rate the social performance of teens with ASD (Gresham et al., 2001).

Furthermore, more similarly aged peers could be trained to act as conversation partners in order to observe a more realistic peer interaction (Hughes et al., 1989) and participants could be matched with conversation partners of the same gender. It should be noted that female confederates were used in the present study due to the lack of male research staff. Next, because subjects’ performance during conversation tasks may be related to the behaviors and demeanor of the confederate, confederates should be carefully trained and researchers should be thoughtful about their use of research confederates across subjects.
For example, if one confederate interacts with all subjects pre-intervention, a different confederate should be used to interact with subject post-intervention to ensure that any improvements in performance are not due to increased comfort interacting with a familiar confederate (as was done in the present study). Additionally, some participants in the present study appeared somewhat anxious about being videotaped during the conversation task (as the video camera was somewhat visible in the room), which may have impacted their social performance. In future observation tasks, it would be beneficial to create more naturalistic environments in which participants are less aware that they are being videotaped. Ultimately, few validated measures exist to assess social performance among individuals with ASD. More studies are needed to assess the validity of preexisting performance-based measures of social skills among individuals with ASD, as measures, such as the Social Performance Rating Scale, have typically been studied in socially anxious populations. Furthermore, it will be important to study such social performance measures among individuals with ASD as well as with individuals who are typically developing in order to identify performance differences that may exist between these two groups. Additionally, promising new observation measures of social skills, such as the Contextual Assessment of Social Skills (Ratto et al., 2012), that are designed specifically for use with individuals with ASD should be further studied in the context of assessing social skills intervention outcomes. It is also important to continue targeting and assessing social cognitive abilities in social skills intervention research involving individuals with ASD. Mehl and colleagues (2010) reported that social performance on the SPRS is associated with individual’s performance on theory of mind tests. Thus, interventions aimed to improve social perspective-taking skills might also serve to
increase actual social skill performance. In order to better assess the relationship between social perspective-taking abilities and observable social skills performance in future research, social cognitive measures should also be further studied. Because individuals with ASD often have increased difficulties with reading comprehension and receptive language, measures such as the Faux Pas Recognition Test might better assess individual’s performance by using video vignettes or visual aids to accompany written or verbal information presented to participants.

Adolescence represents a time that can be extremely difficult for teens with ASD, given that many individuals with ASD have already accumulated a history of negative social experiences by this time, and that the social world during teen years becomes increasingly complex and difficult to navigate. For these reasons, adolescence is perhaps the most important time to make sure that individuals with ASD are provided with appropriate social skills interventions that actually lead to improvements in teens’ social abilities and social functioning. As such, it is crucial to assess individual’s social behavior and performance directly in order to identify whether a social skills intervention is actually producing meaningful and noticeable changes in social skills that are likely to improve participants’ success during social interactions with peers. Ultimately, the present PEERS replication study serves as an example of ways in which social skills intervention research in the field of ASD should and can strive to incorporate performance-based measure to assess whether interventions produce measureable changes in actual social performance. Further investigation is needed to further assess the effects of the PEERS intervention on the actual social performance of teens with ASD in larger samples. Additionally, future research should continue to replicate promising
social skills interventions, such as PEERS, to see if past findings can be reproduced in different community settings by a variety of service providers.
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Appendix A

Recruitment Flyer
Parent Consent Form
Informed Consent Form
Teen Assent Form
Teacher Consent Form
Evidence-Based Social Skills Intervention for Adolescents with Autism Spectrum Disorders

The Program for the Education and Enrichment of Relational Skills (PEERS) Research Project

Program Eligibility Requirements

Participants must:

• Be adolescents, ages 12-17
• Have an ASD diagnosis
• Have social difficulties as a primary concern
• Be motivated to improve social skills
• Have a caregiver who can participate in training sessions
• Commit to 7 weeks of intervention provided twice per week (Monday and Thursday evenings 4:30-6:00pm)
• Be willing to complete research-based assessments

Opportunity to participate in dissertation research program:

The Center for Autism and Related Disabilities at the University of Albany is now offering a group intervention for teens with social difficulties.

The PEERS intervention is being offered at no cost as part of a dissertation research study being conducted through the Center for Autism and Related Disabilities at the University of Albany. This social skills intervention for teens on the autism spectrum provides social skills training in a group format. The program includes small-group instruction, role-playing demonstrations, social coaching, and socialization assignments to help teens learn real-world social skills that will help teens to make and keep friends. The program also consists of concurrent caregiver sessions to help parents learn how to act as social coaches for their teens outside of treatment sessions. Participants are asked to complete research assessments in order for us to evaluate the effectiveness of this social skills intervention.

For more information

Contact the doctoral candidate and program coordinator, Laura Hiruma:
Email: lhiruma@albany.edu
Phone: (518) 442-5412
1535 Western Avenue, Albany, NY
Parental/Legally Authorized Representative (LAR) Informed Permission/Consent Information

Project Title: Program for the Education and Enrichment of Relational Skills (PEERS)

Principal Investigator: Laura Hiruma, M.A.
Department of Psychology
1535 Western Avenue
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Phone: 518-442-5412
lhiruma@albany.edu

Faculty Advisor: Kristin Christodulu, Ph.D.
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kvchristodulu@albany.edu

Co-Investigator: Stephanie Fox, B.S.
Department of Psychology
1535 Western Avenue
Albany, NY 12222
Phone: 518-442-9078
safox@albany.edu

My name is Laura Hiruma, and I am from the Center for Autism and Related Disabilities (CARD) at the University at Albany. Your teen is invited to participate in my dissertation research study.

Purpose: Teens with developmental disabilities often experience social difficulties. In this dissertation research study, I am trying to learn more about how to help teens on the autism spectrum form and maintain friendships with peers. Your teen is being asked to take part in this research study because he/she is a teen on the autism spectrum who is interested in learning social skills to help him/her make and keep friends.

Program Information: This study will take place at the Center for Autism and Related Disabilities (CARD). Initially, your teen will be asked to complete some assessments (about 50-65 minutes to complete) to assess your teen’s social functioning and to determine whether this treatment program will benefit your teen. If we determine that your teen is eligible to join this research study, your teen will be randomly placed in one of two groups, the Social Skills Training Group or the Wait List Group. The group your teen is placed in is determined by chance, like flipping a coin for heads or tails. If your teen is assigned to the Wait List Group, he/she will start the social skills training in approximately 7 weeks. If your teen is placed in the Social Skills Training Group, he/she will be asked to begin the intervention shortly (to attend the next scheduled session). The social skills treatment consists of 14 classes that your teen will participate in with other teens. Classes will be held on Monday and Thursday evenings from 4:30-6:00pm (90 minutes each) over the course of 7 weeks. The classes for your teen will teach him/her how to make and keep friends. Your teen will be asked to complete assessments two additional times over the course of the program (about 50-65 minutes to complete each time) to assess the effectiveness of the social skills treatment. Your teen will also be videotaped during the program so that our researchers can observe how he/she interacts socially.

Risks & Benefits: The researchers hope this study will help us learn more about ways to teach social skills to teens with developmental disabilities. Previous research trials have indicated that this intervention format is linked to improvements in participants’ reported social skills, quality of get-togethers, and friendships with peers (Laugeson, Frankel, Gantman, Dillon, & Mogil, 2012). However, I cannot guarantee that your teen personally will receive any benefits from this research. This project involves only minimal risk to those who join the study. No more risk is involved in this study than what your teen encounters during school testing or when playing games or socializing with other teens. Your teen may feel uneasy at first when starting training classes. To help this, study staff will make efforts to make every teen feel comfortable and accepted. Some teens might become upset by some of the questions that we ask. If there is a
question that makes your teen feel uncomfortable, your teen does not have to answer any questions that he/she does not want to. If your teen is placed in the Wait List Group, please be advised that he/she will have to wait longer before training classes begin.

Confidentiality: Any information that is obtained in connection with this study and that can be identified with your teen will remain confidential and will be disclosed only with your permission or as required by law. We will not identify your teen by name on any of the study data or to anyone outside of the study staff without your prior written permission. We will use a code instead of a name to track the information you have given us. We will keep the files containing study information in locked file cabinets for up to 7 years following the completion of the study. After this point, all data from this study will be destroyed. Although the research team will do their best to maintain your privacy and confidentiality, we cannot promise that the other research participants in the study will do the same.

Video Recordings: As part of the study, I will be videotaping your teen. Any video that is recorded will only be used for research/training purposes at CARO or in professional settings, and your teen’s identity will not be revealed. Video recordings will be stored on a secure server for up to 7 years and will be deleted after this point.

Participation & Withdrawal: Your teen’s participation is voluntary. If you decide to allow your teen to participate, you and/or your teen are free to withdraw your consent and discontinue participation at any time without penalty. If you have any questions about the study, please feel free to contact the principal investigator, Laura Hiruma, at (518) 442-5412 or lhiruma@albany.edu, or the faculty advisor, Kristin Christodulu, at (518) 442-4845 or kchristodulu@albany.edu.

Your Child’s Rights as a Participant: If you have questions concerning your child’s participation in this research or if you wish to report any concerns about the study, please contact the University at Albany’s Office of Regulatory Research Compliance at its toll-free phone number 1-866-857-5459 or via email at hsconcerns@albany.edu.

Consent Agreement & Signature
Your signature indicates that you have read and understand the information provided above, that you willingly agree to allow your teen to participate, that you and/or your teen may withdraw your consent at any time and discontinue participation without penalty, and that you will receive a copy of this form.

________________________________________
Name of Parent or LAR (PRINTED)

________________________________________
Signature of Parent or LAR

________________________________________
Date
INFORMED CONSENT INFORMATION

Project Title: Program for the Education and Enrichment of Relational Skills (PEERS)

Principal Investigator: Laura Hiruma, M.A.
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lahiruma@albany.edu

My name is Laura Hiruma, and I am from the Center for Autism and Related Disabilities (CARD) at the University at Albany. You are invited to participate in my dissertation research study.

Purpose: Teens with developmental disabilities often experience social difficulties. In this dissertation research study, I am trying to learn more about how to help teens on the autism spectrum form and maintain friendships with peers. As part of this study, I am also interested in learning how to teach parents/caregivers to become social coaches for their teens. You are being asked to take part in this research study because you are the parent/legally authorized representative (LAR) of a teen on the autism spectrum and are interested in helping your teen to learn social skills to help him/her make and keep friends.

Program Information: This study will take place at the Center for Autism and Related Disabilities (CARD). Initially, you will be asked to complete some assessments (about 50-65 minutes to complete) about your teen’s social functioning so that we can determine whether this treatment program will benefit your teen. If we determine that you and your teen are eligible to join this research study, your teen will be randomly placed in one of two groups, the Social Skills Training Group or the Wait List Group. You will also participate in parent/caregiver training sessions with other participating parents/caregivers during the time that your teen is in his/her social skills class on Monday and Thursday evenings from 4:30-6.00pm (90 minutes each) over the course of 7 weeks. The group your teen is placed in is determined by chance, like flipping a coin for heads or tails. If your teen is assigned to the Wait List Group, you and your teen will start the social skills training in approximately 7 weeks. If your teen is placed in the Social Skills Training Group, you and your teen will be asked to begin the intervention shortly (to attend the next scheduled session). The parent/caregiver training consists of 14 sessions that will teach you about helping your teen make and keep friends. You will be asked to complete assessments two additional times over the course of the program (about 50-65 minutes to complete each time) to assess the effectiveness of the social skills treatment.

Risks & Benefits: The researchers hope this study will help us learn more about ways to teach social skills to teens with developmental disabilities and train parents/caregivers to help their teens make and keep friends. However, I cannot guarantee that you personally will receive any
benefits from this research. This project involves only minimal risk to those who join the study. No more risk is involved in this study than what you might encounter in a group setting. You may feel uneasy at first when starting training classes. To help this, study staff will make efforts to make every parent/caregiver feel comfortable and accepted. You might become upset by some of the questions that we ask. If there is a question that makes you feel uncomfortable, you do not have to answer any questions that you do not want to. If you and your teen are placed in the Wait List Group, please be advised that you will have to wait longer before training classes begin.

Confidentiality: Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. We will not identify you by name on any of the study data or to anyone outside of the study staff without your prior written permission. We will use a code instead of a name to track of the information you have given us. We will keep the files containing study information in locked file cabinets for up to 7 years following the completion of the study. After this point, all data from this study will be destroyed. Although the research team will do their best to maintain your privacy and confidentiality, we cannot promise that the other research participants in the study will do the same.

Participation & Withdrawal: Your participation is voluntary. If you decide to participate, you are free to withdraw your consent and discontinue participation at any time without penalty. If you have any questions about the study, please feel free to contact the principal investigator, Laura Hiruma, at (518) 442-5412 or lhiruma@albany.edu, or the faculty advisor, Kristin Christodulu, at (518) 442-4845 or kvchristodulu@albany.edu.

Your Rights as a Participant: If you have any concerns about your rights as a research participant or if you wish to report any concerns about the study, please contact the University at Albany's Office of Regulatory Research Compliance at its toll-free phone number 1-866-857-5459 or via email at hsconcerns@albany.edu.

Consent Agreement & Signature

Your signature indicates that you have read and understand the information provided above, that you willingly agree to participate, that you may withdraw your consent at any time and discontinue participation without penalty, and that you will receive a copy of this form.

Name of Participating Parent/Caregiver (PRINTED)

__________________________________________
Signature of Participating Parent/Caregiver      Date
Project Title: Program for the Education and Enrichment of Relational Skills (PEERS)

Principal Investigator: Laura Hiruma, M.A.
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Albany, NY 12203
Phone: 518-442-4845

Co-Investigator: Stephanie Fox, B.S.
Department of Psychology
1535 Western Avenue
Albany, NY 12203
Phone: 518-442-9078

My name is Laura Hiruma, and I am from the Center for Autism and Related Disabilities at the University at Albany. I am asking you to take part in this dissertation research study because you are a teen who is interested in learning social skills to help you make and keep friends.

Purpose: In this dissertation research study, I am trying to learn more about how to help teens make friends. If you decide to be a part of this study, you will be asked to have a 3-minute conversation while being videotaped. Our researchers will watch this videotape to see how you get along with another person. These videotapes might also be shown to other researchers and professionals to teach them about this project. You will also be asked to take some tests that will take about 50-65 minutes to complete. You will be asked questions about yourself and what you know about social skills and friendships. If the tests show that our program will be a good fit for you, you will also be asked to be in one of our social skills groups and take classes with other teens in the study. You might take the class right away or after waiting about 7 weeks. These classes will be on Monday and Thursday evenings for 90 minutes (from 4:30-6:00pm) and will take place over 7 weeks. Your [mom/dad/caregiver] will also be taking classes at the same time to learn how to help you make and keep friends.

Risks & Benefits: The researchers hope that this study will help us learn better ways to teach teens how to use social skills to make and keep friends. You might feel nervous or uncomfortable when first starting the classes. If this happens, just let us know and we will help you as best we can.

Withdrawal: I have already asked your parent(s) if it is okay for me to ask you to take part in this research study. Even though your parent(s) already said it is okay for you to be in the study, you still get to decide if you want to be in the study. You do not have to be in this study if you don’t want to and you can quit the study at any time. If you don’t like a question, you don’t have to answer it and, if you ask, your answers will not be used in the study. No one will get mad or be upset if you decide you don’t want to participate or if you change your mind later and want to stop.

You can ask questions now or whenever you wish. If you have a question, you can call me at my phone number (518-442-5412) or email me at hiruma@albany.edu.

If you agree to be in this study, I will give you and your parents a copy of this information.

Name of Person Obtaining Assent (Printed)  Name of Teen (Printed)

Signature of Person Obtaining Assent  Date
TEACHER INFORMED CONSENT INFORMATION

Project Title: Program for the Education and Enrichment of Relational Skills (PEERS)

Principal Investigator: Laura Hiruma, M.A.
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Co-Investigator: Stephanie Fox, B.S.
Department of Psychology
1535 Western Avenue
Albany, NY 12203
Phone: 518-442-9078
safox@albany.edu

My name is Laura Hiruma, and I am from the University at Albany. You are invited to participate in my dissertation research study.

Purpose: You are being asked to take part in this research study because you are the teacher of a student who is participating in my dissertation research project at the University at Albany. As part of this research study, I am trying to gather information about this student's behavior and functioning at school.

Program Information: You have been provided with a copy of a document indicating that your student's parent has given us permission to contact you and has authorized you to complete these assessments regarding your student. If you choose to participate in this research study, you will be asked to complete some assessments about your student at three different times (about 15-20 minutes to complete each time) over the course of the next 14 weeks. Each of these assessments will be mailed to your school address and should be returned to the principal investigator, Laura Hiruma, using a paid postage envelope that will be provided to you. You will be asked to complete the assessments and mail back the forms within 2 weeks of receiving them. You may receive a reminder phone call from our research team within 2 weeks of receiving these documents if they have not been returned. This data will help us learn more about your student at school and will help us to evaluate the quality of our research program.

Risks & Benefits: The researchers hope this study will help us learn more about teens like your student and will help us to better evaluate our research program. However, I cannot guarantee that you personally will receive any benefits from this research. This project involves only minimal risk to those who join the study. To compensate you for the time that you spend filling out and returning the assessments, we will offer you a $10 gift card to Target stores once we have received all three sets of completed assessment forms from you at the end of the next 14 weeks.

Confidentiality: Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as

Page 1
required by law. We will not identify you by name on any of the study data or to anyone outside of the study staff without your prior written permission. We will use a code instead of a name to track of the information you have given us. We will keep the files containing study information in locked file cabinets for up to 7 years following the completion of the study. After this point, all data from this study will be destroyed.

**Participation & Withdrawal:** Your participation is voluntary. If you decide to participate, you are free to withdraw your consent and discontinue participation at any time without penalty. If you have any questions about the study, please feel free to contact the principal investigator, Laura Hiruma, at (518) 442-5412 or lhiruma@albany.edu, or the faculty advisor, Kristin Christodulu, at (518) 442-4845 or kychristodulu@albany.edu.

**Your Rights as a Participant:**
If you have questions concerning your rights as a research participant or if you wish to report any concerns about the study, please contact the University at Albany’s Office of Regulatory Research Compliance at its toll-free phone number 1-866-857-5459 or via email at hsconcerns@albany.edu.

**Consent Agreement & Signature**
Your signature indicates that you have read and understand the information provided above, that you willingly agree to participate, that you may withdraw your consent at any time and discontinue participation without penalty, and that you will receive a copy of this form.

______________________________________________
Name of Participating Teacher (PRINTED)

___________________________________________  ________________
Signature of Participating Teacher  Date

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Appendix B

Conversation Task Outline and Guidelines: Time 1
Conversation Task Outline and Guidelines: Time 2
Conversation Task Outline and Guidelines: Time 3
Social Performance Rating Scale (Adapted Version)
Social Performance Rating Scale (SPRS)

Conversation Task Outline and Confederate Guidelines


Conversation task designed by: Laura S. Hiruma. (2013). University at Albany, State University of New York

Conversation Task Overview:

- Each participant will be videotaped during a 5-minute unstructured conversation with a research confederate

- The project coordinator will take the research subject into the waiting room and introduce him/her to the research confederate:
  
  o "Hi __________. This is ______. He/She is here to learn more about the PEERS project too. I have to look over some paperwork for a few minutes, but what I'd like you two to do is to talk for a bit and do your best to get to know each other while you're waiting. You can talk about anything you'd like, but you should ask each other questions to keep a conversation going. I'll be back in about 5 minutes. Sound good?"

- Research confederates are to remain neutral and relatively passive, yet open to conversation throughout the 5-minute interaction. Use only the prompts that are listed below to attempt to initiate conversation during the task. If the research participant does not engage in conversation, simply accept any response they provide and remain quiet/neutral the rest of the time. Do respond neutrally to any questions or comments the participant does make.

Allowable Prompts to Begin Conversation in Role Play #1:

- "Hey, how's your week been going?" OR "How was your weekend?"
  
  o If the research participant does NOT ask you, make a brief neutral statement ("I went to my friend's birthday party this weekend")
  
  o If asked details, "It was at my friend's house, we ate pizza, watched movies, and played games"

- "What school do you go to?" followed by "What's your school like?"
  
  o If the research participant does NOT ask you, make a brief neutral statement ("I go to SUNY Albany")

- While looking at Entertainment magazine, "Have you seen any good movies lately?" followed by "What types of movies do you like?"
  
  o If the research participant does NOT ask you, make a brief neutral statement ("I like comedies and scary movies")
Allowable Responses During Conversation:

• You should answer any questions that the research participant poses to you.

• Respond to participant’s comments to your questions pleasantly, yet neutrally:
  - “Cool,” “That’s nice,” “Me too,” “That sounds fun,” etc.

• Follow the participant’s flow of conversation while remaining neutral: do not provide overly eager responses even if the participant maintains conversation. Stick to the conversation prompts that were listed above, and avoid asking follow-up questions to participant’s responses (instead, make neutral comments). You may respond to participant’s follow-up questions, however, if they ask you.
Social Performance Rating Scale (SPRS)

Conversation Task Outline and Confederate Guidelines


Conversation task designed by: Laura S. Hiruma. (2013). University at Albany, State University of New York

Conversation Task Overview:

- Each participant will be videotaped during a 5-minute unstructured conversation with a research confederate

- Conversations will take place in the CARD play room, which will be set-up as a waiting room

- The project coordinator will take the research subject into the waiting room and introduce him/her to the research confederate:
  
  o “Hi (confederate). This is _________. He/She is here for the PEERS project. Just like before, I have to step out for a few minutes, but what I’d like you two to do is to talk for a bit and do your best to get to know each other while you’re waiting. You can talk about anything you’d like, but you should ask each other questions to keep a conversation going. I’ll be back in about 5 minutes. Sound good?”

- Research confederates are to remain neutral and relatively passive, yet open to conversation throughout the 5-minute interaction. Confederates should take special care to avoid being too active or too cold during conversation. Use only the prompts that are listed below to attempt to initiate conversation during the task. If the research participant does not engage in conversation, simply accept any response they provide and remain quiet/neutral the rest of the time. Do respond neutrally to any questions or comments the participant does make.

Allowable Prompts to Begin Conversation in Role Play #2:

- “Hey, how’s your week been going?” OR “How was your weekend?”
  
  o If the research participant does NOT ask you, make a brief neutral statement (“I actually went to _______ this weekend”)

- “What grade are you in?” followed by “What are your classes like?”
  
  o If the research participant does NOT ask you, make a brief neutral statement (“I go to SUNY Albany”)

- “Are you going anywhere cool this summer?“/ “Is there anywhere you’d like to go?“
  
  o If the research participant does NOT ask you, make a brief neutral statement (“I really want to go to the beach this summer”)
Allowable Responses During Conversation:

- You should answer any questions that the research participant poses to you.

- Respond to participant’s comments to your questions pleasantly, yet neutrally:
  - “Cool,” “That’s nice,” “Me too,” “That sounds fun,” etc.

- Follow the participant’s flow of conversation while remaining neutral: do not provide overly eager responses even if the participant maintains conversation. Stick to the conversation prompts that were listed above, and avoid asking follow-up questions to participant’s responses (instead, make neutral comments). You may respond to participant’s follow-up questions, however, if they ask you.
Social Performance Rating Scale (SPRS)
Conversation Task Outline and Confederate Guidelines


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- The project coordinator will take the research subject into the waiting room and introduce him/her to the research confederate:
  
  o “Hi __________. This is _______. He/She is here for the PEERS project. Just like you did before, I’m going to step out for a few minutes, but I’d like you two to talk for a bit and do your best to get to know each other while you’re waiting. You can talk about anything you’d like, but you should ask each other questions to keep a conversation going. I’ll be back in about 5 minutes. Sound good?”

- Research confederates are to remain neutral and relatively passive, yet open to conversation throughout the 5-minute interaction. Confederates should take special care to avoid being too active or too cold during conversation. Use only the prompts that are listed below to attempt to initiate conversation during the task. If the research participant does not engage in conversation, simply accept any response they provide and remain quiet/neutral the rest of the time. Do respond neutrally to any questions or comments the participant does make.

Allowable Prompts to Begin Conversation in Role Play #2:

- “Hey, how’s your week been going?” OR “How was your weekend?”
  o If the research participant does NOT ask you, make a brief neutral statement (“I actually went to ______ this weekend”)

- “Do you live around here?” followed by “What is your neighborhood like?”
  o If the research participant does NOT ask you, make a brief neutral statement (“I live really close to SUNY Albany”)

- “Do you have any plans for the summer?”/ “What do you like to do for fun when you’re not in school?”
  o If the research participant does NOT ask you, make a brief neutral statement (“This summer I think I’m going to___________” OR “I like to_________”)

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Allowable Responses During Conversation:

- You should answer any questions that the research participant poses to you.

- Respond to participant’s comments to your questions pleasantly, yet neutrally:
  - “Cool,” “That’s nice,” “Me too,” “That sounds fun,” etc.

- Follow the participant’s flow of conversation while remaining neutral; do not provide overly eager responses even if the participant maintains conversation. Stick to the conversation prompts that were listed above, and avoid asking follow-up questions to participant’s responses (instead, make neutral comments). You may respond to participant’s follow-up questions, however, if they ask you.
Social Performance Rating Scale


Directions:
Observe each participant’s social performance during the video-recorded conversations. While observing, pay special attention to each participant’s behaviors specific to the following: (1) gaze; (2) vocal quality; (3) length of verbal responses; (4) level of apparent discomfort; and (5) conversation flow. Select the behavior rating that BEST describes the participant’s performance during the conversation in each of these categories. Rate behaviors of the participants ONLY and not the behaviors of the research confederate.

<table>
<thead>
<tr>
<th>A.1 GAZE</th>
<th>refers to the quality of eye contact that the participant makes with his/her conversation partner throughout the interaction.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very Poor: Participant completely avoids looking at the partner or stares continually.</td>
</tr>
<tr>
<td>2</td>
<td>Poor: Participant avoids eye contact (or stares) for majority of time. Disruptive to performance.</td>
</tr>
<tr>
<td>3</td>
<td>Fair: Participant frequently avoids eye contact (or stares). Gaze pattern is mildly disruptive to performance.</td>
</tr>
<tr>
<td>4</td>
<td>Good: Participant occasionally avoids eye contact or tends to look too much (stares) while partner is speaking or during shifts of conversation.</td>
</tr>
<tr>
<td>5</td>
<td>Very Good: Participant keeps eye contact during the conversation, does not stare; shifts focus during pauses and conversation.</td>
</tr>
</tbody>
</table>

Score:

<table>
<thead>
<tr>
<th>A.2 VOCAL QUALITY</th>
<th>refers to the tone of voice and quality of verbal expression that the participant exhibits during conversation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very Poor: (a) Participant speaks in a flat, monotonous voice; or (b) speaks at a low volume or mumbles; or (c) speaks over loudly, or has intrusive tone (harsh or unpleasant voice quality).</td>
</tr>
<tr>
<td>2</td>
<td>Poor: (a) Participant demonstrates no warmth, enthusiasm, or interest in verbal expression; or (b) volume somewhat low and speech somewhat unclear; or (c) speaks a little bit too loudly, or tone is somewhat intrusive or sarcastic.</td>
</tr>
<tr>
<td>3</td>
<td>Fair: (a) Participant shows some warmth in verbal expression but at most times sounds unenthusiastic or uninterested; and (b) speaks in appropriate volume (given partner’s volume); has clear voice quality; and (c) does not have an intrusive or sarcastic tone.</td>
</tr>
<tr>
<td>4</td>
<td>Good: (a) Participant shows moderate warmth and but inconsistent enthusiasm or interest. Could also be too ‘gushy’ (seems fake or forced); and (b) and (c) are as in Fair.</td>
</tr>
<tr>
<td>5</td>
<td>Very Good: Participant is warm and enthusiastic in verbal expression without sounding condescending or gushy.</td>
</tr>
</tbody>
</table>

Score:
### A.3 LENGTH
refers to the overall length of the participant’s comments and responses during the conversation.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very Poor: Monosyllabic ('hmm', 'yeah', 'OK') speech turns; or responses so long that partner must interrupt or cannot utter reply.</td>
</tr>
<tr>
<td>2</td>
<td>Poor: Participant makes mostly short statements with very long pauses; or speaks in long phrases that monopolize the conversation.</td>
</tr>
<tr>
<td>3</td>
<td>Fair: Participant mostly speaks one sentence at a time with occasional long pauses between sentences; or s/he tends to talk excessively (or tangentially) most of the time but allows some responses from the partner.</td>
</tr>
<tr>
<td>4</td>
<td>Good: Participant mostly speaks in statements of one or two sentences without any major pauses, but there are other occasions where speech is short or excessive or tangential.</td>
</tr>
<tr>
<td>5</td>
<td>Very Good: At most times, participant’s utterances are two or more sentences long. Participant acknowledges partner’s remarks without taking over and monopolizing the conversation.</td>
</tr>
</tbody>
</table>

**Score:**

---

### A.4 DISCOMFORT
refers to the apparent overall physical comfort and posture exhibited by the participant throughout the conversation.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very High: Complete rigidity of arms, legs or whole body. Constant leg movements or fidgeting with hands, hair or clothing. Extremely stiff face or constant facial tics. Frequent nervous throat clearing, swallowing, or stuttering. Frequent inappropriate giggling or laughing. Look of extreme discomfort and desire to flee situation shown by 2 or more breaks in role. Participant does not pay attention to the role-play tasks most of the time.</td>
</tr>
<tr>
<td>2</td>
<td>High: Rigidity or fidgeting for majority of time. Difficulty sitting still is somewhat disruptive to conversation. Stiff face or frequent facial tics. Some nervous throat clearing or swallowing. Some inappropriate giggling or laughing. Participant shows signs of discomfort by frequently looking around. There is no more than 1 break in the role-play.</td>
</tr>
<tr>
<td>3</td>
<td>Moderate: No rigidity. Slight movements of legs, fidgeting, throat clearing, or swallowing. Participant shows only brief periods of discomfort. Focuses on the role-play tasks most of the time. There are no interruptions in the role-play.</td>
</tr>
<tr>
<td>4</td>
<td>Low: No rigidity, nervous throat clearing, or swallowing. Minimal fidgeting that is not disruptive to performance. No notable signs of discomfort. Remains focused on the role-play tasks throughout the role-play. At times may appear relaxed and at ease (smiling or gesturing).</td>
</tr>
<tr>
<td>5</td>
<td>Very Low: Relaxed body posture and natural body movement. Participant laughs and smiles at appropriate times. S/he shows effective gesturing (to be distinguished from fidgeting). Participant focuses on the task all the time, does not appear at all uncomfortable, but at ease in situation.</td>
</tr>
</tbody>
</table>

**Score:**
### A.5 CONVERSATION FLOW:
refers to the overall quality of the conversational flow and reciprocal exchange, as demonstrated by the participant.

<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Very Poor: Participant makes few attempts to initiate the conversation. Even when prompted by the partner, participant cannot maintain the conversation. Participant uses almost no open-ended questions, or is intrusive in questions and shows no empathy. Participant does not attend to information provided by partner.</td>
</tr>
<tr>
<td>2</td>
<td>Poor: Participant tries to initiate the conversation but is only successful about half the time. The conversation does not flow smoothly, but is more like an interview than a conversation (participant does not follow up on topics and does not provide free information about him/herself). Participant sometime forgets factual information provided by the partner (repeats questions).</td>
</tr>
<tr>
<td>3</td>
<td>Fair: For the most part, the participant is able to maintain the conversation with little help from the partner, although the conversation is still somewhat awkward and stalls at times. Participant asks some open-ended questions. Participant provides little free information and may forget the partner’s comments.</td>
</tr>
<tr>
<td>4</td>
<td>Good: Participant is able to maintain the conversation with little to no help from the partner. The conversation flows smoothly (given partner’s responses), the participant discloses something about self, and then asks partner a related question (e.g., open-ended questions). Shows interest in partner, and follows up appropriately on partner’s remarks. No obvious deficits.</td>
</tr>
<tr>
<td>5</td>
<td>Very Good: Participant easily maintains the conversation and responds smoothly to pauses in conversation, often by following up on previous information provided by the partner or providing free information about the self on a related topic. Participant introduces new topics fluidly and frequently uses open-ended questions. Participant shows genuine interest in the partner and follows up on the partner’s remarks with warmth and enthusiasm.</td>
</tr>
</tbody>
</table>

**Score:**

---

### SCORING

- **GAZE:** __
- **VOCAL QUALITY:** __
- **LENGTH:** __
- **DISCOMFORT:** __
- **CONVERSATION FLOW:** __
- **TOTAL SCORE:** ___
Table 1

_Mean Demographics and Baseline Measures for Treatment and Delayed Treatment Control (DTC) Groups (standard deviations in parentheses)_

<table>
<thead>
<tr>
<th>Variable</th>
<th>Immediate Treatment (n = 6)</th>
<th>DTC (n = 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>14.5 (1.6)</td>
<td>13.6 (1.7)</td>
</tr>
<tr>
<td>Grade</td>
<td>8.8 (1.6)</td>
<td>7.8 (2.0)</td>
</tr>
<tr>
<td>Percent male</td>
<td>100.0</td>
<td>100.0</td>
</tr>
<tr>
<td>Percent mainstreamed</td>
<td>83.3</td>
<td>100.0</td>
</tr>
<tr>
<td>KBIT-2 verbal IQ</td>
<td>90.3 (17.0)</td>
<td>99.2 (10.0)</td>
</tr>
<tr>
<td>KBIT-2 nonverbal IQ</td>
<td>102.8 (8.6)</td>
<td>105.8 (12.2)</td>
</tr>
<tr>
<td>KBIT-2 IQ composite</td>
<td>96.5 (7.8)</td>
<td>103.2 (8.2)</td>
</tr>
<tr>
<td>AQ-A</td>
<td>31.5 (5.8)</td>
<td>36.8 (5.8)</td>
</tr>
<tr>
<td>Vineland-II communication</td>
<td>75.7 (8.1)</td>
<td>76.8 (9.6)</td>
</tr>
<tr>
<td>Vineland-II socialization</td>
<td>75.0 (7.1)</td>
<td>73.3 (11.5)</td>
</tr>
<tr>
<td>Vineland-II composite</td>
<td>74.0 (1.4)</td>
<td>76.0 (4.6)</td>
</tr>
</tbody>
</table>
Table 2

*Mean Pre- (Time 1) and Post-Treatment (Time 2) Scores on Teen Measures of Interest for the Treatment and Delayed Treatment Control (DTC) groups (standard deviations in parentheses)*

<table>
<thead>
<tr>
<th>Teen Measures</th>
<th>Immediate Treatment (n = 6)</th>
<th>DTC (n = 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>TASSK-R</td>
<td>49.3 (5.9)</td>
<td>80.0 (12.7)</td>
</tr>
<tr>
<td>SPRS Total</td>
<td>13.7 (3.1)</td>
<td>14.83 (2.8)</td>
</tr>
<tr>
<td>Faux Pas Detection (n = 6, 4)</td>
<td>0.64 (.25)</td>
<td>0.73 (.16)</td>
</tr>
<tr>
<td>SAS-A Total (n = 5, 4)</td>
<td>37.4 (12.6)</td>
<td>30.0 (10.3)</td>
</tr>
<tr>
<td>FQS-A Total (n = 6, 4)</td>
<td>72.0 (14.5)</td>
<td>75.7 (17.6)</td>
</tr>
<tr>
<td>QSQ-A Host (n=6, 4)</td>
<td>1.8 (2.1)</td>
<td>2.0 (1.8)</td>
</tr>
<tr>
<td>QSQ-A Invite (n = 5, 3)</td>
<td>1.0 (.89)</td>
<td>1.8 (.84)</td>
</tr>
<tr>
<td>QSQ-A Total (n = 6, 3)</td>
<td>4.2 (4.4)</td>
<td>7.7 (14.1)</td>
</tr>
<tr>
<td>Piers-Harris-2 Total</td>
<td>44.4 (7.7)</td>
<td>47.5 (7.3)</td>
</tr>
</tbody>
</table>
Table 3

*Mean Pre- (Time 1) and Post-Treatment (Time 2) Scores on Parent Measures of Interest for the Treatment and Delayed Treatment Control (DTC) groups*

*(standard deviations in parentheses)*

<table>
<thead>
<tr>
<th>Parent Measures</th>
<th>Immediate Treatment (n = 6)</th>
<th>DTC (n = 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>QSQ-P Host</td>
<td>0.83</td>
<td>4.0</td>
</tr>
<tr>
<td>QSQ-P Invite (n = 6, 4)</td>
<td>0.83</td>
<td>1.3</td>
</tr>
<tr>
<td>SSIS-P Social (n = 5, 4)</td>
<td>85.0</td>
<td>91.2</td>
</tr>
<tr>
<td>SAS-A Parent Total</td>
<td>52.7</td>
<td>45.0</td>
</tr>
<tr>
<td>Olweus-P Frequency</td>
<td>1.5</td>
<td>0.2</td>
</tr>
</tbody>
</table>
Table 4

*Mean Pre- (Time 1) and Post-Treatment (Time 2) Scores on Teacher Measures of Interest for the Treatment and Delayed Treatment Control (DTC) groups (standard deviations in parentheses)*

<table>
<thead>
<tr>
<th>Teacher Measures</th>
<th>Immediate Treatment (n = 6)</th>
<th>DTC (n = 5)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre</td>
<td>Post</td>
<td>Pre</td>
<td>Post</td>
</tr>
<tr>
<td>SSIS-T Social (n = 4, 4)</td>
<td>80.3 (9.7)</td>
<td>82.75 (11.1)</td>
<td>90.3 (10.1)</td>
<td>85.8 (13.2)</td>
</tr>
<tr>
<td>SRS-T Total (n = 5, 4)</td>
<td>63.0 (10.1)</td>
<td>67.2 (21.9)</td>
<td>60.75 (6.1)</td>
<td>63.25 (9.3)</td>
</tr>
<tr>
<td>Olweus-T Frequency (n = 5, 4)</td>
<td>1.4 (1.9)</td>
<td>1.0 (1.4)</td>
<td>0.75 (1.0)</td>
<td>0.50 (0.58)</td>
</tr>
</tbody>
</table>
Figure 1. Group Means on the Test of Adolescent Social Skills Knowledge--Revised
Figure 2. Group Means for Parent-Reported Hosted Get-Togethers on the Quality of Socialization Questionnaire
Figure 3. Group Means for Parent-Reported Total Scores on the Social Anxiety Scale--Adolescent Version