

## Examining the Efficacy of an Adapted Version of the UCLA PEERS® Program with Canadian Adolescents

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### Abstract

*The present study examined the effectiveness of an adapted version of the Program for the Education and Enrichment of Relational Skills (PEERS®) with a group of adolescents with ASD and social skills deficits. Social skills were measured using the Social Skills Improvement System-Rating Scales (SSIS-RS)(Gresham & Elliot, 2008) and the Quality of Play Questionnaires (QPQ)(Frankel & Mintz, 2011). Post-tests indicated significant increases in assertion on Student Forms of the SSIS-RS, and improved quality of play. Follow-up tests indicated significant overall improvements on the Student Forms of the SSIS-RS, and the conflict measure of the QPQ. Findings indicate a general improvement in social skills at post-test with statistical significance only seen at follow-up. This suggests that the PEERS® program may be best suited as a 14-week intervention rather than a condensed 7-week intervention. However, future studies should compare both program lengths in order to further understand these results.*

**Keywords:** Social Skills Programs, Autism, Adolescence, Friendship, PEERS®

### 1. Introduction

Autism Spectrum Disorder (ASD) is distinguished as a severe developmental disorder characterized by core deficits and abnormalities in language and communication, social functioning, and stereotypical or unusual behaviours and interests (Laugeson, Gantman, Dillon, & Mogil, 2012; Mash & Wolfe, 2010), such as a restricted field of focus. A prevalence study completed in the U.S. by the Autism and Developmental Disabilities Monitoring (ADDM) Network of the Center for Disease Control (CDC) found that in 2010 the overall prevalence of ASD was 1 in 68 for 8-year-old children. Furthering their study, it was found that prevalence rates continue to be higher among boys (1 in 42) than girls (1 in 189) (Center for Disease Control, 2014). The increasing number of children diagnosed with ASD, coupled with the many challenges they face provides motive and importance in continuing research in order to improve their overall quality of life. There is a growing concern regarding the availability and appropriateness of treatment interventions available for this population. The greatest concern are the social disabilities that these children face, as they are one of the least understood aspects of this disorder (Flynn & Healy, 2012; Volkmar & Klin, 1993).

Although behavioral interventions used to address the core features of ASD including, expressive and receptive language, and repetitive behaviors like self-stimulating behaviors, have achieved relatively successful outcomes(Rogers & Vismara, 2008), behaviors such as social reciprocity and communication deficits continue to be prominent difficulties in this population (Tse, Strulovitch, Tagalakis, Meng & Fombonne, 2007; Laugeson et al., 2012). Presently, there is a growing and systematic move for inclusion of children and adolescents with ASD into regular classrooms. These youth will therefore interact more often with their typically developing peers, making the gap in their social skills more evident. Thus, the growing population of mainstreamed youth creates a greater need for evidence-based social skills interventions (Laugeson et al., 2012).

## 1.2 Social skills in adolescents with ASD

Adolescents with ASD have difficulty “communicating with others, processing and integrating information from the environment, establishing and sustaining social relationships with others, and participating in new environments” (Bellini, Peters, Benner, & Hope, 2007, p. 153). Furthermore, they also have specific social deficits that include difficulties initiating interactions, sharing, theory of mind (or taking another person’s perspective), inferring the interests of others and maintaining a mutual exchange (Bellini et al., 2007). Additionally, having social skills deficits may lead to many developmentally negative outcomes such as, peer rejection, anxiety, depression, substance abuse, and other forms of psychopathology (Bellini et al., 2007). When gone untreated, many adolescents with ASD experience loneliness and mood problems (White & Roberson-Nay, 2009).

As adults, these individuals then lack the community connections and friendships that are important for a high quality of life. Interventions to improve social functioning prior to adulthood are critical. Therefore, teaching these adolescents the necessary social skills to make, keep friends and interact properly with peers may have a positive and significant lifelong impact (Laugeson & Frankel, 2010). For these reasons, the quality of friendships for adolescents with autism is of great importance in helping them develop the appropriate developmental and social skills necessary to have a higher quality of living. However, there is a developmental trajectory in social development where the “black and white” social skills needed for younger children are no longer adequate for the more complex “grey” social world of an adolescent. In adolescence, there is a greater need for understanding the social cues that accompany developmental maturity. This is often where adolescents with ASD have difficulties, and research has shown that these difficulties remain an area of distress even for the most cognitively able individuals on the autism spectrum (Reichow & Volkmar, 2010).

Using a developmental approach as a primary focus of interventions recognizes the evolving maturational stages of social skills throughout the lifespan. For children with ASD, critical skills including social referencing and co-regulation need to be taught in a developmental progression (Cullinane, 2011). The goals of social skills interventions therefore need to vary according to the developmental level of the individual. Traditionally, because of their social impairments, children with ASD were assumed to lack a desire to foster meaningful relationships with others. However, recent research has debunked these claims and has discovered that individuals with autism do report having friends (Locke, Ishijima, Kasari, & London, 2010). Unfortunately, many children and pre-adolescents with ASD report higher levels of loneliness and less fulfillment in their friendships when compared to their typically developing (TD) peers (Bauminger & Kasari, 2000). Due to their initial impairments, children with ASD have an increased risk for experiencing difficulties getting along with peers, as well as, often displaying anxious symptoms. This difficulty results in avoidance of social situations, over arousal in social contexts, and an inability to understand and respect expected social rules (Cotugno, 2009). Researchers argue that individuals with ASD do not generally outgrow their social skills deficits; rather these difficulties persist into their adult life and ultimately continue to negatively impact the individual’s social functioning (DeRosier, Swick, Davis, McMillen, & Matthews, 2011). Most interventions have focused their attention on decreasing behavioral difficulties, specifically in younger children (Wolfberg & Schuler, 1993), while few evidence-based social skills interventions have been invested in looking at the effectiveness of social skills training in early to late adolescence (Laugeson & Frankel, 2010, National Autism Center, 2009). Further, social skills interventions often do not incorporate the structured involvement of parents in the intervention. Thus, revealing a gap in the literature. This study aimed to address the areas of social difficulty presented by a group of adolescent children with ASD and social skills deficits.

## 1.3 Parents’ involvement in adolescents with ASD

There is often a tendency to over-estimate a person’s internal factors, while under-estimating the importance of environmental factors and context in explaining behavior. Bronfenbrenner’s ecological model of human development would disagree with this attribution and argue that the child’s functioning is influenced by a web of bi-directional relationships, including, family, school, peers, neighbourhood and wider society (Bronfenbrenner, 1994). Therefore, creating interventions that treat adolescents, as isolated units are limited, and should have a parent component in order to provide social, and emotional support, as well as, sources of information for parents. In fact, it is the parent components, or parent groups that have been identified as one of the most noteworthy developments in resources that effectively support families of adolescents with ASD (Mandell & Salzer, 2007).

Parents have a significant impact on the success of their children through either direct instruction or supervision. Involved parents help to maintain learned skills (Laugeson et al., 2012), as well as, provide support in the development and generalization of these social skills. Involving parents in treatment has been shown to increase the probability of a positive outcome as well as benefit the parents. Studies have shown that parents of adolescents with developmental disabilities are highly satisfied with the “sense of agency and belonging” they attain by participating in these groups (Mandell & Salzer, 2007, p. 112). After participating in these groups, parents feel confident and empowered in handling issues regarding their children (Lo, 2010). They become better instructors and coaches and are better equipped to support their children’s needs. Through the many advantages for both adolescents and parents in treatment, it is clear that including parents in the intervention is a critical component to a successful outcome.

Effective interventions are required to meet the needs of adolescents with ASD and their families. Further, addressing the social skills deficits of this population, at this stage in their development would diminish subsequent difficulties in adulthood. The intervention chosen for this study, the UCLAPEERS® program is a parent-assisted Cognitive-Behavioral Intervention for adolescents with social skills deficits and on the autism spectrum. It has shown success in teaching, as well as, practicing social skills with the goal of acquiring high-quality friendships. The present study examined the effectiveness and durability of an adapted version of the PEERS® program. The effectiveness of this intervention (i.e., gains in social skills) was examined through a pre- and post-test study design with a 7-week follow-up test.

#### **1.4 PEERS® program**

The PEERS® program is a parent-assisted intervention that focuses on adolescents in middle school and high school (youth between ages 12 and 17 years old), who struggle with making or keeping friends. This program is an extension of the Children’s Friendship Training program (Frankel & Myatt, 2003), which has been shown to be an effective parent-assisted intervention model for improving friendship skills for elementary-aged children with ASD. The intervention includes separate sessions for parents and adolescents that meet weekly for 90 minutes over a 14-week period (Laugeson & Frankel, 2010). However, in the current study the length and intensity of the program was adapted with the developer, Dr. Laugeson’s, approval, to having participants meet twice a week over a 7-week period. This was done to increase intensity of learning and understand the effectiveness of the PEERS® program when it is offered on a modified schedule. The group focused on social skills such as, “having conversations; entering and exiting conversations; using electronic forms of communication; choosing appropriate friends; handling teasing, bullying, and other forms of social rejections; handling arguments and disagreements with friends; and having appropriate get-togethers with friends, including how to be a good host and a good sport” (Laugeson & Frankel, 2010, p. 3).

Skills were taught to both parents and adolescents using psycho-educational and cognitive behavioral approaches. In 2009, the first randomized controlled trial of the PEERS® program was published, comparing 17 adolescents with ASD receiving the intervention method matched with a delayed control group of 16 adolescents with ASD, 13 to 17 years old. Results revealed that in comparison to the control group, the treatment group significantly improved their knowledge of social skills concepts, increased frequency of hosted get-togethers, and progressed in overall social skills as reported by both parents and adolescents (Laugeson & Frankel, 2010). In a later study, 28 adolescents (14 in treatment group, 14 in control-delayed treatment group) were assessed after undergoing the PEERS® program. Results indicated, again, improvements in all domains tested. Further, results from parents suggested that adolescents significantly decreased ASD symptoms relating to social responsiveness by the end of the treatment. Follow-up assessments (14 weeks after intervention) showed that most treatment gains were maintained, and some additional treatment gains were observed in relation to decreased problem behaviours (Laugeson et al., 2012). In contrast to Frankel and Simmons’ (1992) report that as many as 43% to 58% of participants drop-out during most outpatient treatments; both studies attrition rates were low with only 6 drop-outs (14.6%) in the first study and 4 drop-outs (12.5%) in the second study. The combined results and low attrition rates found in these studies suggest that the PEERS® program as a parent-assisted social skills intervention leads to improvements in friendship skills for adolescents with ASD (Laugeson & Frankel, 2010).

Recent studies have shown that participating in the PEERS® program also diminishes social anxiety, core autistic symptoms and problematic behaviours (Schohl et al., 2014). Additionally, in a study by Van Hecke et al. (2013), a randomized controlled trial of adolescents with ASD who had participated in the PEERS® program were examined using EEG asymmetry to see if the program affected neural functioning.

Results indicated that adolescents with ASD who completed the PEERS® program showed a shift from right-hemisphere dominant EEG activity before PEERS® to a left-hemisphere dominant pattern of EEG activity after PEERS® was completed. Additionally, these left-dominant asymmetry patterns were not significantly different from a typically developing group of adolescents (Van Hecke et al., 2013). Left-hemisphere EEG asymmetry was associated with more social interactions and understanding, and fewer symptoms of autism (Van Hecke et al., 2013). Finally, in a study by Yoo et al. (2014), the effectiveness of a Korean version of PEERS® for enhancing social skills was examined. Results indicated improvements in social skills as rated by parents and adolescents. Furthermore, direct observation using the Autism Diagnostic Observation Scale (ADOS) and formal assessments using the Korean version of the Vineland Adaptive Behavior Scale (EHWA-VABS) also revealed significant improvements after treatment (Yoo et al., 2014).

The results of the PEERS® program have generally been positive however, this program is still relatively new and continued evaluation needs to be conducted. In the present study, the effectiveness of this program on a Canadian population was evaluated adding a new dimension to the current research. In addition, changing the length and intensity of the program allowed for a better understanding of how the PEERS® program may be adapted to the needs of different populations. The research questions for this study were as follows: (1) What effects does participating in the PEERS® program have on the performance of social skills of adolescents with ASD as perceived by parents and by the participating adolescents? (2) What effects does participating in the PEERS® program have on the quality of play (QPQ) as perceived by parents and participating adolescents? (3) Do the changes made to the implementation of the PEERS® program (i.e. changing duration to 7-weeks and intensity to twice a week) affect the results compared to previous findings?

The previous research on the PEERS® program (Laugeson & Frankel, 2010; Laugeson et al., 2012; Schohl et al., 2014; Van Hecke et al., 2013; Yoo et al., 2014) allowed the following predictions for this study. It was expected that, in congruence with past research, results would indicate an improvement in social skills, and hosted get-togethers. Further, it was expected that the changes in duration and intensity may possibly show even lower rates of attrition than previous studies, would not have negative effects on improvements, and might have more significant improvements at follow-up than post-test (as participants may need more time to integrate the information learned). Additionally, it was expected that at the 7-week follow-up problem behaviours, as described in the *Social Skills Improvement System- Rating Scales (SSIS-RS)* would decline, due to a decrease in frustration that was previously encountered when these adolescents tried maintaining friendships.

## 2. Methods

### 2.1 Participants

The participants in this study received their ASD diagnosis under the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition Text Revised (DSM-IV-TR)*<sup>1</sup>. Using this definition, ASD is categorized under the diagnostic category of Pervasive Developmental Disorders, which represents a group of five related diagnoses including Autism, Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS), Rett's syndrome, Childhood Disintegrative Disorder and Asperger's Disorder (American Psychiatric Association, 2000). It is acknowledged that the new DSM-5 has revised the definition of ASD into one single condition with different levels of severity and two core domains; 1) deficits in social communication and social interaction and 2) restricted repetitive behaviors, interests, and activities (RRBs) (American Psychiatric Association, 2013).

Inclusion criteria for adolescent participants included: (a) between 12 and 17 years of age, (b) experiencing social difficulties as recognized by parents, (c) previously diagnosed with ASD by a reliable mental health professional or strongly suspected to have ASD symptoms at the time of referral by a trained professional, (d) verbally fluent with and within the ordinary bounds of cognitive development with below-average to average intelligence ( $IQ > 70$ ), (e) motivated and in agreement to participate in treatment, (f) no history of major mental illness (e.g., schizophrenia, bipolar disorder, or other types of psychotic disorders), and (g) no current problems with aggressive behaviors.

The participants in the intervention were eleven ( $N=11$ ), 13-17-year-old adolescents ( $M = 14.59$ -years-old,  $SD = 1.31$ ) diagnosed with ASD (i.e., as per ger's syndrome or High-Functioning Autism and Pervasive Developmental Disorder Not Otherwise Specified) and as having social skills deficits (as reported by parents). The mean Autism score on the parent form of the SSIS-RS at pre-test for participants was 17.1.

Most of the participants (64%) were taking medication (either directed for Anxiety or ADHD) before the program began and continued to follow their prescribed doses during and after the program. All participants continued to attend either their regular school programs or adapted programs in a variety of neighbourhood schools in the Montreal area. The parent group was mandatory, and as such, there was always a minimum of eleven parent participants ( $N=11$ ) present during each session. All the above information was confirmed during a pre-phone screening and at the intake interview. No inducements to participate were given, however adolescents were provided with a “graduation party” at the end of the program where graduation certificates and movie passes were handed out for their achievements and hard work throughout the program.

## 2.2 Measures

This research project was given ethical approval by the University’s Office of Research. Following this approval, recruitment began through purposive sampling methods, using flyers, notices, chain-referrals and advertisements. Only those families who indicated an interest, met the criteria for the group program and were available to meet twice a week over a 7-week period were included in the program.

The adolescents and parents were given separate consent forms prior to participating in the program. Specifically, the adolescents were taken into another room and were read the adolescent assent form describing the purpose of the PEERS® program, what it entailed, and asking whether they wanted to participate in the program. Adolescents were then asked to provide oral consent if they agreed to participate in the program, while being assured that their participation was voluntary and if at any point they wanted to discontinue participation there would be no penalties. Parents were informed of the purpose and goals of the PEERS® program and asked to give written consent on behalf of their children given that they were minors under the age of 18-years-old. Primary outcome measures included self-report and parent-rated questionnaires quantifying social ability and problem behaviors directly related to social skills.

## 2.3 Social Skills Improvement System-Rating Scales (SSIS-RS) (Gresham & Elliot, 2008)

During both pre-test, post-test and follow-up the SSIS-RS was administered. The SSIS-RS is a revision of the Social Skills Rating Systems (SSRS-R; Gresham & Elliot, 1990) designed to assist in the screening and classification of students who have significant social skills deficits. The SSIS-RS utilizes multiple versions, consists of 76 items and takes approximately 15 minutes to complete (Crosby, 2011).

There are two versions of the questionnaire, a Parent version and a Student version. Further, within the student versions there are scales available for three age groups; one of these groups was used in the following study, the scale for older children (ages 13-18). Psychometric properties were reported by Gresham and Elliot (2008) for parent questionnaires with coefficient alphas above .77, and test-retest reliability above .73. Items on the parent questionnaire provide frequency-based ratings from “never” to “almost always,” and are written at a fifth-grade level to ensure readability. The student questionnaire uses a 4-point scale from “not true” to “very true,” and is written at a second-grade level to ensure understanding and readability (Crosby, 2011).

There are two scales on this questionnaire, Social Skills and Problem Behaviours, which were derived from factor analysis. The Social Skills scale includes subscales of “communication, cooperation, assertion, responsibility, empathy, engagement, and self-control”. The Problem Behaviour scale includes subscales of “externalizing, internalizing, hyperactivity/inattention, autism spectrum, and bullying” and is designed to assess behaviours that interfere with the attainment or performance of socially appropriate behaviours (Crosby, 2011; Gresham & Elliot, 2008). Higher scores on the social skills scale indicate better social functioning and lower scores on the Problem Behaviour Scale indicate better behavioral functioning. Parents and adolescents completed the questionnaire at three intervals: (1) before the group began (at intake interview), (2) during the last program session, and (3) at the 7-week follow-up.

## 2.4 The Quality of Play Questionnaire (QPQ) (Frankel & Mintz, 2011)

There are two versions of the *Quality of Play Questionnaire* (QPQ), one administered to parents (QPQ-P), and one administered to the adolescents (QPQ-A). Both questionnaires consist of 12-items that assess the frequency of get-togethers with peers over the previous month and the level of conflict during these get-togethers. Ten of the 12 items make up the conflict scale and ask the individual to rate the peer conflict (either observed or encountered) (i.e. “We did things without each other” or “They criticized or teased each other”).

These ten items are rated as either “Not At All,” “Just a Little True,” “Pretty Much True,” or “Very Much True” (Laugeson et al., 2010). The other two items ask the individual to estimate the number of invited and hosted get-togethers that the participant has had in the previous month. The QPQ was developed by using a factor analysis of the responses of 175 boys and girls, and has a coefficient alpha of .87 for the conflict scale. A Spearman correlation of .55 for the conflict scale, and .99 for the frequency of hosted or invited get-togethers, between parent and adolescent ratings at baseline was observed for a randomized controlled trial of PEERS® (all  $p$ 's < .001) (Laugeson & Frankel, 2010). In all, these 12 items take approximately two to three minutes to complete, and were administered during the pre-test, post-test, and at follow-up, individually by parents and adolescents.

## 2.5 Procedure

### Pre-test, post-test and follow-up

The pre-test was given at intake interview to both parents and adolescents, in different quiet rooms. There was a trained research assistant available for the parents as well as one available for the adolescents to read instructions to the questionnaires, answer any preliminary questions and make sure participation was voluntary (i.e., both consent and assent was given). The post-test was completed on the last week of treatment. The parent group leader was present with the parents and the adolescent group leader along with three research assistants was available to assist adolescents. The follow-up tests were completed seven weeks after the intervention ended. Again, there was a trained research assistant available for both parents and adolescents.

### 2.6 Sessions

A trained graduate student led adolescent sessions with extensive experience working with children and adolescents with ASD. They followed a didactic lesson plan, using the Socratic Method and Role Playing methods of teaching, as well as, activities used as opportunities for behavioral rehearsal. Parent sessions were led by a trained graduate student with previous experience working with parents and consisted of a review of the skills and principles being taught that week. Homework was assigned at the end of each session to both adolescents and parents, and was reviewed with participants at the beginning of the next session. Parent handouts were provided, giving an overview of the lesson plan for that session and the homework assignment, with a detailed description of the parents' part in the homework assignment. The PEERS® was implemented as designed by using the manual in order to avoid inconsistencies in implementation.

## 3. Results

### 3.1 Effectiveness of intervention

The adolescents and parents completed the SSIS-RS and QPQ forms at pre-, post-intervention and follow-up to determine the effectiveness of the PEERS® program on social skills. The results of the SSIS-RS social skill and problem behavior scales were analyzed according to the respondents (Student Form and Parent Form) using paired sample t-tests. Employing Cohen's  $d$  evaluation benchmarks and calculations, effect sizes were estimated using the mean difference scores divided by the pooled standard deviations (Lakens, 2013). Tests for assumptions of paired sample t-tests revealed no outliers according to the outlier labelling rule (Hoaglin & Iglewicz, 1987), and normal distribution of data according to tests for skewness and kurtosis. The mean difference scores for social skills and problem behaviors were not statistically significant between pre- and post-test.

Further analyses were conducted to examine the changes on the individual social skills subscales and problem behaviors subscales. There was no statistical significance in mean scores on the problem behaviors subscale; however the results demonstrated statistically significant change in mean scores on the assertion social skill subscale ( $M = -2.54$ ,  $SD = 2.62$ ,  $t(10) = -3.22$ ,  $p = .01$ ,  $d = -.97$ ) (See Table 1). The results obtained on the parent form demonstrated no statistical significance in either the social skills subscale or the problem behaviors subscale.

**Table 1: Mean Difference Score, Standard Deviations and T-scores on the SSIS-RS Student Form Pre-Post-test (n = 11)**

Behaviors	<i>M</i>	<i>SD</i>	<i>T</i>	<i>df</i>	<i>P</i>	<i>D</i>
Social Skills	3.08	25.25	0.41	10	0.69	.12
Communication Pre-Post-test	-0.18	2.92	-0.21	10	0.84	-.06
Cooperation Pre- Post-test	0.18	2.60	0.23	10	0.82	.07
Assertion Pre-Post-test	-2.54	2.62	-3.22	10	0.01**	-.97
Responsibility Pre- Post-test	0.45	2.91	0.52	10	0.62	.15
Empathy Pre- Post-test	0.72	2.45	0.98	10	0.35	.30
Engagement Pre- Post-test	0.18	2.48	0.24	10	0.81	.07
Self-Control Pre- Post-test	-1.73	3.16	-1.81	10	0.10	-.54
Problem Behaviors	1.81	14.31	0.42	10	0.68	.13
Externalizing Pre- Post-test	-0.18	6.84	-0.09	10	0.93	-.03
Bullying Pre- Post-test	0.00	2.89	0.00	10	1.00	0
Hyperactivity/Inattention Pre-Post test	1.00	3.82	0.87	10	0.41	.30
Internalizing Pre- Post-test	1.73	5.35	1.07	10	0.31	.32

Note: *M* = mean; *SD* = standard deviation; *df* = degrees of freedom; *d* = Cohen's *d*. \*\* $p \leq .01$

The results from the QPQ were also analyzed according to the respondents (Student Form and Parent Form) using paired sample t-tests. There were statistically significant mean difference scores between Pre- and Post-test on the Student Forms for: Overall Mean Get-togethers ( $M = -1.23$ ,  $SD = 0.96$ ,  $t(10) = -4.25$ ,  $p < .01$ ,  $d = -1.3$ ), Overall Number of Friends Listed ( $M = -1.14$ ,  $SD = 1.57$ ,  $t(10) = -2.41$ ,  $p < .05$ ,  $d = -.73$ ), and Observed Conflict ( $M = 4.32$ ,  $SD = 5.62$ ,  $t(10) = 2.54$ ,  $p < .05$ ,  $d = .77$ ). The results obtained on the parent form show statistically significant gains in: Overall Mean Get-togethers ( $M = -1.00$ ,  $SD = 1.05$ ,  $t(10) = -3.16$ ,  $p = .01$ ,  $d = -.95$ ), Overall Number of Friends Listed ( $M = -0.82$ ,  $SD = 1.03$ ,  $t(10) = -2.63$ ,  $p < .05$ ,  $d = -.80$ ), while Observed Conflict approached significance with a strong Cohen's *d* effect size of .77. The effects of the PEERS® program on outcome variables at a 7-week follow-up were evaluated with paired sample t-tests (T1 – T3) for both respondents (Student Form and Parent Form) with both the SSIS-RS and the QPQ.

Results from the SSIS-RS at 7-week follow-up for the Student Forms indicated that statistically significant gains were made in both social skills ( $M = -14.91$ ,  $SD = 13.84$ ,  $t(10) = -3.57$ ,  $p < .01$ ,  $d = -1.08$ ), and problem behaviours ( $M = 10.27$ ,  $SD = 9.94$ ,  $t(10) = -3.57$ ,  $p < .01$ ,  $d = 1.03$ ). Further analysis revealed statistically significant gains in both the social skills and problem behaviors subscales (Table 2).

**Table 2: Mean Difference Scores, Standard Deviations and T-scores on SSIS-RS Student Form at 7-week Follow-up (n=11)**

Behaviors	<i>M</i>	<i>SD</i>	<i>T</i>	<i>df</i>	<i>p</i>	<i>d</i>
Social Skills	-14.91	13.84	-3.57	10	0.00**	-1.08
Communication Pre-Follow-up	-1.45	3.20	-1.50	10	0.16	-.50
Cooperation Pre- Follow-up	-0.73	4.29	-0.56	10	0.58	-.20
Assertion Pre- Follow-up	-3.18	3.22	-3.28	10	0.00**	-1.16
Responsibility Pre- Follow-up	-2.00	2.53	-2.62	10	0.02*	-.80
Empathy Pre- Follow-up	-0.82	2.36	-1.15	10	0.27	-.35
Engagement Pre- Follow-up	-2.54	3.47	-2.43	10	0.03*	-.73
Self-Control Pre- Follow-up	-4.45	2.25	-6.56	10	0.00**	-1.98
Problem Behaviors	10.27	9.94	-3.57	10	0.00**	1.03
Externalizing Pre- Follow-up	3.82	4.53	2.79	10	0.01**	.84
Bullying Pre- Follow-up	1.82	3.06	1.97	10	0.07	.60
Hyperactivity/Inattention Pre- Follow-up	2.18	2.13	3.39	10	0.00**	1.02
Internalizing Pre- Follow-up	4.54	4.25	3.55	10	0.00**	1.07

Note: *M* = mean; *SD* = standard deviation; *df* = degrees of freedom, *d* = Cohen's *d*.

\* $p \leq .05$ ; \*\* $p \leq .01$

Table 3 illustrates the results for the Parent Form at 7-week follow-up. There were no statistically significant results; however, the externalizing problem behaviors subscale approached significance with a strong Cohen's *d* effect size of .61.

**Table 3: Mean Difference Scores, Standard Deviations and T-Scores on SSIS-RS Parent Form at 7-week Follow-up (n=11)**

Behaviors	<i>M</i>	<i>SD</i>	<i>T</i>	<i>df</i>	<i>p</i>	<i>D</i>
Social Skills	-0.82	7.15	-0.38	10	0.71	-.11
Communication Pre- Follow-up	-1.18	2.27	-1.72	10	0.11	-.52
Cooperation Pre- Follow-up	0.09	0.94	0.32	10	0.75	.10
Assertion Pre- Follow-up	0.54	2.21	0.82	10	0.43	.24
Responsibility Pre- Follow-up	0.18	1.83	0.33	10	0.74	.10
Empathy Pre- Follow-up	0.36	1.43	0.84	10	0.42	.30
Engagement Pre- Follow-up	0.18	2.40	0.25	10	0.80	.08
Self-Control Pre- Follow-up	-1.00	3.84	-0.86	10	0.40	-.30
Problem Behaviors	4.36	10.83	1.33	10	0.21	.40
Externalizing Pre- Follow-up	1.91	3.14	2.01	10	0.07	.61
Bullying Pre- Follow-up	0.27	1.35	0.67	10	0.51	.20
Hyperactivity/Inattention Pre- Follow-up	1.09	3.59	1.01	10	0.33	.30
Internalizing Pre- Follow-up	1.45	3.80	1.27	10	0.23	.40
Autism Pre- Follow-up	1.91	5.48	1.15	10	0.27	.35

Note: *M* = mean; *SD* = standard deviation; *df* = degrees of freedom, *d* = Cohen's *d*.

The effects of the PEERS® program on student outcome variables at the 7-week follow-up for the QPQ, revealed statistically significant mean difference scores in Observed Conflict ( $M = 5.41$ ,  $SD = 5.51$ ,  $t(10) = 3.26$ ,  $p < .01$ ,  $d = .98$ ). Finally, the results of program outcomes from Time 1 - Time 3 for the QPQ Parent Forms revealed once more statistically significant mean difference scores in Observed Conflict ( $M = 3.33$ ,  $SD = 2.18$ ,  $t(9) = 4.59$ ,  $p < .01$ ,  $d = 1.53$ ).

#### **4. Discussion**

The purpose of this study was to evaluate the effectiveness of the PEERS® intervention program for enhancing social skills in adolescents with ASD and/or social skills deficits. The overall treatment completion rate was 100%, with no attrition, and an absentee rate of 9%. Thereby, confirming the assumption that a condensed program would lead to lower attrition rates (0% compared to 12.5% in previous PEERS® studies) (Laugeson et al., 2012).

In examining the effectiveness of the PEERS® program, the SSIS-RS and the QPQ results demonstrated statistically significant improvements from pre-test to follow-up (T1 – T3) in overall social skills, specifically, assertion, responsibility, engagement and self-control; as well as, decreased overall problem behaviors, specifically, externalizing behaviors, hyperactivity/inattention, and internalizing behaviors. Several other social skills and problem behaviors (i.e., communication, bullying and Autism Spectrum behaviors) showed improvement between time 1 and time 3, although the measurements were not statistically significant.

Additionally, the QPQ demonstrated statistically significant decreased levels of conflict during get-togethers from time 1 to time 3, and improvements in overall mean get-togethers and overall mean number of friends listed for get-togethers, although these measurements were not statistically significant. The time between post-test and follow-up tests occurred within the winter holiday period and it was suggested through parent communications that get-togethers decreased during this time due to time constraints (as winter holidays are normally spent on vacation or with family). In view of this, the inconsistency of results from the SSIS-RS and QPQ are understandable.

This study nonetheless adds to the growing body of evidence in support of the PEERS® program as a parent-assisted group intervention employing psycho-educational and cognitive-behavioral treatment techniques to teach social skills (for example, communication, appropriate uses of humor, and handling disagreements) to adolescents with ASD or social skills deficits.

Several interesting patterns emerged from the findings on the SSIS-RS Student and Parent Forms. To begin, although parents saw improvements in their child's social skills and decreased problem behaviors there was a discrepancy in results when compared to Student Forms. This is in accordance with past research which has shown that adolescents with ASD report better social skills relative to parent reports (Lerner, Calhoun, Mikami, & De Los Reyes, 2012). Additionally, in a study by Lerner, Calhoun, Mikami and De Los Reyes (2012), the self-report ratings of adolescents with ASD did not differ from self-report ratings of the normative sample on the SSRS, yet parents' ratings were "at least a standard deviation lower" than the SSRS standardization sample parent ratings (Lerner et al., 2012, p. 2687). It can be hypothesized that parents of adolescents with ASD, as compared to parents' of a normative sample, tend to underestimate their child's social skills. Moreover, it was observed that adolescents with ASD who reported greater social skills compared to parent-reports had parents with a lower sense of self-efficacy (Lerner et al., 2012). It is thus possible, that parent reports are in some way clouded by their own anxiety and perceived abilities in dealing with their child's social skills deficits.

Another interesting finding from the SSIS-RS (and one that contrasted our hypothesis) was the limited amount of statistically significant results from time 1 to time 2, demonstrating significant improvements only in assertion. Parents did see improvements, although not statistically significant, in communication, responsibility, empathy, engagement, and decreased externalizing behaviors, bullying, hyperactivity/inattention, internalizing behaviors and Autism Spectrum behaviors. These results differ from previous research on the PEERS® program (Laugeson & Frankel, 2010; Laugeson et al., 2012; Yoo et al., 2014), which found significant results at post-test for both social skills and problem behaviors. As the only component changed between the current and previous studies was administration time, this would suggest that the PEERS® program is better suited and provides stronger results as a 14-week intervention. As was also suggested in our hypothesis, perhaps students needed more time to integrate information between classes, and thus only began to show significant improvements at follow-up. These results however continue to further the interest of the PEERS® program authors, and provide valuable insight towards the implications of condensing PEERS® into a 7-week program.

#### **5. Limitations of the Study**

There were some limitations to the present study. To begin, this study had a relatively small sample size. Additionally, the sample included only one female participant.

This lack of diversity and small sample size causes the findings to be less generalizable to a larger, more diverse population. Another limitation was the lack of control group (delayed treatment group). One of the research questions in the study was to examine the effects of adapting the program to 7-weeks, two times a week. It would thus, also have been beneficial to have a 14-week intervention group. This would have allowed a comparison to the 7-week intervention results not only with delayed treatment group but also with a 14-week intervention group. Lastly, using parent-rating scales as one of the primary outcome measures, given the fact that parents were participants in the parent group, may have allowed for possible bias in their reports. For example, because parents were also learning about appropriate social skills, it is possible they expected more from their children and were less able to see the improvements that had been made. In this sense, additional assessments from a third respondent, such as the child's teacher, or behavioral observations of the adolescent's social skills in naturalistic interactions would have been beneficial toward establishing further validity of the findings.

### **6. Future Directions and Conclusions**

The implications of this study are that ecologically valid social skills can be taught using psycho-educational and cognitive-behavioral treatment techniques. In turn, problem behaviors can be managed through this group intervention setting. The results of the study suggest that the PEERS® program seems to be a more effective method in increasing adolescent's social skills when given in a 14-week format as compared to a 7-week format, thereby allowing adolescents increased ability to integrate and practice learned skills.

Furthermore, having a parent group at the same time as the adolescent group allowed parents to be more informed and confident social coaches for their children. Indeed, providing parents with the information, tools and strategies to help their child, and then allowing for discussion with others in their immediate surroundings, increased the likelihood of consistency in supporting behaviors at home, school, and community. In fact, many parents stated that the parent component was extremely beneficial and that they would have liked to continue participating in the group.

A future direction of the current study would include gathering data, especially on friendship development, at a long-term follow-up. Allowing for a long-term follow-up would provide information on how the adolescents' face the next significant transitions in their lives, and would yield useful information toward determining the durability of the findings and assess any changes that may occur. Recent reports have indicated that 14-weeks after intervention there was maintenance of "social skills knowledge, social responsiveness, and overall improvements in social skills" (Schohl et al., 2014, p. 343). Moreover, in a study by Mandelberg et al. (2014), it was reported that some of these improvements continued to be apparent one to 5 years later.

Social anxiety and social skills deficits are likely related to one another (White & Roberson-Nay, 2009), and those with ASD have been found to significantly report more social anxiety symptoms than their typically developing peers (Bellini, 2004). Therefore, it might also be helpful for future directions to include measures of anxiety both physiological and those dependent on behavioral measures of social skills.

The present study was a replication of the PEERS® program, with modifications to program length and greatly adds to the emergent literature regarding social skills interventions for adolescents with ASD and/or social skills deficits. This study provides an independent replication and the first adaptation of PEERS® to 7-weeks, and thus greatly augments knowledge on intervention effectiveness. The current study found positive outcomes of participation in PEERS® at both post-test and 7-week follow-up, and statistically significant results at follow-up. These findings do indicate improvements and suggest that the PEERS® program is best suited as a 14-week intervention for adolescents with social skills deficits rather than a condensed 7-week intervention. However, further studies comparing the 7-week to 14-week PEERS® program would need to be conducted, in order to further understand the results and make any reasonable conclusions.

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