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Use of the Program for the Education and Enrichment of Relational Skills (PEERS) Intervention to Improve Social Skills and Peer Relationships among Adolescent Adoptees

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ABSTRACT

The present study evaluated the efficacy of the Program for the Education and Enrichment of Relational Skills (PEERS) among 45 adolescent adoptees who were struggling with peer relationships. Results revealed improvements in adolescent social knowledge, friendship quality, satisfaction with social relationships, and self-concept, an increased number of peer get-togethers, and reductions in social anxiety and depression. Parents reported improvements in their child's social skills and empathy as well as reduced social anxiety symptoms in their child. Teacher measures also revealed improved social skills within the school context. The PEERS intervention may be helpful for adoptees who are experiencing difficulties with social skills and developing peer relationships.

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While many adopted individuals demonstrate strong social competence and high-quality peer relationships (Tan, 2018), research suggests that there is a great deal of heterogeneity regarding social outcomes (Hawk & McCall, 2014) with adoptees experiencing elevated risk for social difficulties, such as social cue processing or peer rejection, compared with non-adopted peers (Palacios et al., 2013). Given the important role that peer relationships play in risk for psychopathology, especially beginning in adolescence (Prinstein et al., 2018), it is crucial to provide targeted intervention to address social skills among adoptees who are experiencing challenges. However, there are no existing, manualized social skills interventions that have been specifically evaluated among school-age or adolescent adoptees. The current study sought to evaluate the impact of the Program for the Education and Enrichment of Relational Skills (PEERS), a program with extensive empirical support in the context of autism (Laugeson et al., 2012), for adopted adolescents who were experiencing

social difficulties. Study participants were adolescents, aged 13–17, who had been adopted internationally, through domestic foster care, or domestic private infant adoption contexts as well as their parents. PEERS was chosen as a suitable intervention because session content aligned well with the particular social challenges that have been identified for a subset of adoptees (i.e., social cue processing, Humphreys et al., 2019) and because the intervention allowed enough flexibility to introduce adoption-relevant topics (i.e., responding to adoptive microaggressions) while maintaining fidelity to the intervention manual.

Dimensions of social competence

Social competence and social skills represent related, though distinct, constructs (McFall, 1982). Social competence refers to a level of effectiveness in navigating social interactions and relationships, while social skills are the requisite skills necessary to achieve competence. While many models exist describing the various dimensions of social competence, a recent review of these models (Grover et al., 2020) suggests that achieving social competence requires skills in four main areas: social communication, emotion regulation, cognitive skills, and social problem-solving skills. Social communication refers to the verbal and nonverbal aspects of communication that occur within social interactions. This could include taking turns in a conversation or appropriate use of eye contact. Emotion regulation refers to the ability to change the inward emotional experience or the outward behavioral expression of emotion in social contexts, for example remaining calm when having a disagreement. Cognitive skills refer to both thinking and reasoning specific to social interaction (i.e., informational knowledge about social cues) but also include general cognitive skills, such as attention and executive functioning that influence social interactions. Last, social problem-solving refers to the ability to identify and select preferred solutions in a social context that may have multiple options for responding (i.e., navigating conflict with a friend). Grover et al. (2020) identify these four areas as prime targets for intervention programs seeking to increase social competence.

Social development & links to adjustment

Typically, in early childhood, social skills develop in the context of attachment relationships with caregivers, who provide both modeling and scaffolding support. For example, caregivers can give just enough help initially for a child to successfully navigate a social situation, such as initiating play with an unfamiliar child, and then slowly wean that help as the child

becomes more independent in a given social situation (Newman Kingery et al., 2020). During the preschool period, reciprocal peer relationships begin to form and as children enter the school age period there is increasing emphasis on the development of friendships with peers, with these relationships playing an important role in the development of necessary social skills. During adolescence, peer relationships play a central role in social functioning and there is generally greater independence in initiation and management of friendships (Newman Kingery et al., 2020). Social groups, such as cliques or crowds, form and adolescents tend to experience greater amounts of peer influence on behavior and decision making. At the same time, increases in peer victimization, relational aggression, and social anxiety resulting from self-evaluation in comparison to others also increases during adolescence, making this a challenging developmental period to navigate (Newman Kingery et al., 2020).

Successful development of friendships and social competence during this adolescent time period has been linked with a range of positive outcomes through adolescence and adulthood. For example, adolescents with close friendships have a better self-concept, higher levels of happiness and life satisfaction, and have lower levels of loneliness and internalizing and externalizing symptoms (reviewed in Kamper-DeMarco et al., 2020). Adolescent friendships provide opportunities to further hone social skills in increasingly complex relationships, forming the basis for adult friendships and romantic relationships (Ha et al., 2019). They have also been identified as a strong predictor of resilience during adolescence for individuals who have experienced early adversity, such as abuse and neglect (van Harmelen et al., 2017).

Social functioning among adoptees

Given this trajectory of social skill development, those who have experienced disruptions in early caregiving, abuse, neglect, and/or institutionalization in early childhood may have increased risk for deficits in social competence for a variety of reasons. From a biological standpoint, research has found that exposure to abuse and neglect has especially negative neurodevelopmental consequences in the frontal and temporal lobes and limbic system (McLaughlin et al., 2014; Puetz et al., 2014), areas involved in several dimensions of social competence such as emotion regulation and social cognitive skills (i.e., theory of mind). From a psychosocial standpoint, several factors could increase risk for adoptees. Attachment quality with caregivers is a strong predictor of social relationships later in life, given its foundational role in the development of social competence. For example, among previously institutionalized children attachment quality

at 42 months predicted a higher number of friendships at age 16 and also predicted higher quality interactions with those friends during lab observation of dyad interactions (Tang et al., 2021). In this same study, participants who had remained in institutional care for longer periods and those in foster care with insecure attachment in early childhood had fewer and lower quality friendships when they reached adolescence. Beyond attachment, adoptees who experience caregiving disruptions, neglect/abuse or institutionalization generally have fewer opportunities in early childhood to engage socially with peers while receiving the necessary adult scaffolding required to promote social skill development (Tierney Williams et al., 2010). Also, themes that have been identified as particularly salient for adoptees in therapeutic contexts, such as abandonment, worth, rejection, and trust can influence social motivation and social anxiety when adoptees are attempting to initiate new peer and romantic relationships or deepen existing relationships (Waterman et al., 2018).

Finally, barriers to establishing reciprocal peer relationships can be related to the post-adoption environment. For example, internationally adopted children who are adopted at older ages may have different cultural expectations and values related to social behaviors and social communication patterns that were established in their birth countries that may conflict with expectations and values in their adoptive context. Additionally, research has found that adoptees experience adoptive microaggressions from peers and other adults starting at a young age, which could be a barrier to peer relationships (reviewed in Garber, 2020). This may especially be the case for adoptees of color transracially adopted into white families, as they may experience the intersection of racial/ethnic and adoptive microaggressions from peers, and in some cases be without the family support necessary to navigate these experiences (Leslie et al., 2013).

With this accumulation of risk factors across biopsychosocial domains during sensitive periods of social development, the social competence of adoptees is an important area of study both in terms of describing outcomes and in identifying ways to support resilience. Early research examining social outcomes among young children who had experienced institutional care identified a pattern of social behavior marked by atypical approach of and engagement with strangers, termed indiscriminate friendliness (Tizard, 1977; Chrisholm et al., 1995). This included behaviors such as showing affection to strangers or being willing to wander off with a stranger without checking with caregivers. More recently, this social pattern is understood in the context of Disinhibited Social Engagement Disorder (DSED) in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013). It has been observed in a substantial minority of internationally adopted children who

experienced depriving institutional care (Rutter et al., 2007) as well as children domestically adopted from foster care (Bruce et al., 2009). Though it was originally conceptualized as an attachment disturbance, disinhibited social behavior has been observed in the context of secure attachment with adoptive parents and is more closely related to a child's inhibitory control (Bruce et al., 2009).

In addition to this pattern of disinhibited social engagement found in some adoptees, existing research has identified increased risk for challenges across a variety of the dimensions of social competence, particularly among adoptees who have experienced abuse, neglect and/or institutional care. Although the findings are mixed and suggest a great deal of heterogeneity (Tan & Camras, 2011), studies have reported that adoptees are rated as having, on average, poorer social skills and less prosocial behavior relative to control groups (Almas et al., 2015; Pitula et al., 2014). Research examining specific domains within social competence has reported poorer social communication (Levin et al., 2015; Petranovich et al., 2017; Wade et al., 2020;), difficulties with emotional understanding and socio-emotional cue processing (Humphreys et al., 2019; Parker et al. 2005; Wismer Fries & Pollak, 2004), and social cognition deficits, such as with theory of mind and executive functioning (Colvert et al., 2008; Tarullo et al., 2007; Selcuk et al., 2018), compared with non-adopted samples. This increased risk for difficulties with social skills has been linked to peer relationships, as adopted samples have been reported to experience greater difficulties with forming peer relationships (DeLuca et al., 2019) and had fewer positive emotional bonding behaviors with friends during lab-based simulations that required cooperation and emotionally laden conversation (Tang et al., 2021) relative to comparison groups. Adopted children are also at increased risk for peer rejection (Palacios et al., 2013), experiencing bullying and victimization by peers (Pitula et al., 2014; Raaska et al., 2012) and have more peer difficulties as rated by teachers (Pitula et al., 2019).

A variety of predictors have been identified that increase the risk for these difficulties with peer relationships and social skills among adoptees. Among demographic factors that have been identified, poorer social outcomes have been linked with longer lengths of time in depriving and/or abusive environments (Gunnar et al., 2007; Guyon-Harris et al., 2019; Hawk & McCall, 2014; Tang et al., 2021), international adoption from Eastern European countries (Barcons et al., 2012, Tan & Camras, 2011), and for boys (Hawk & McCall, 2014; Pitula et al., 2014, Raaska et al., 2012). Studies also tend to find greater social skill challenges when assessing adoptees during the adolescent period, as opposed to earlier in childhood (Julian & McCall, 2016), likely due to the increased complexity of social expectations during that developmental period. Additionally,

psychosocial factors such as the presence of attachment difficulties (Guyon-Harris et al., 2019) and inhibitory control deficits (Humphreys et al., 2019; McDermott et al., 2013; Mukerji et al., 2021) also increase risk for poor peer social outcomes among adoptees. Within the post-adoptive environment, parenting has also been found to be a predictor. Specifically, emotionally responsive and supportive parenting (Jaffari-Bimmel et al., 2006; Perry et al., 2021) that also provides limit setting and structure (DePasquale et al., 2020) promotes positive social outcomes for adopted children and adolescents.

While the social competence of adoptees is increasingly well characterized by the research literature, a significant gap that emerges is how to best support adoptees who are struggling with peer relationships due to deficits in social communication, social cognition, socio-emotion regulation, and/or social problem-solving skills and/or challenges in their post-adoptive environment. While interventions with adoptive and foster parents to support socio-emotional competence in their children during the toddler and preschool period exist (Lind et al., 2021), no manualized, adoption-specific social skill interventions have been developed for school-age or adolescent adoptees. Also, to our knowledge, no studies examining the effectiveness of any existing social skill interventions with solely adopted participants have been conducted. Given the research described above identifying adolescence as a particular period of increased risk for adoptees as well as the key role that social competence and peer relationships play in adolescent and adult mental health and wellness, research on ways to support adolescent adoptees in making and keeping friends is sorely needed.

Current study

Due to the lack of adoption-specific social skill interventions for adolescents, the current study utilized the Program for the Education and Enrichment of Relational Skills (PEERS) for adolescents, a manualized, 16-week group-based intervention that addresses a range of skills across the various domains of social competence (Laugeson et al., 2012). While a variety of versions of this intervention exist, the current study utilized the parent-assisted version, which includes concurrently run teen and parent groups that address a range of ecologically valid social skills and situations, such as conversation skills, entering and exiting conversations, electronic communication, get-togethers, humor, changing reputations, and handling teasing, rumors, and bullying. PEERS utilizes a combination of psychoeducation, modeling, behavioral rehearsal, feedback, and reinforcement both within sessions and during parent-supported homework

assignments out of session. Randomized control trials evaluating PEERS have demonstrated improvements in social knowledge, social communication skills, frequency of peer gatherings, and higher quality of peer interactions for non-adopted adolescents with autism (Dolan et al., 2016; Laugeson et al., 2012; Schohl et al., 2014; Yoo et al., 2014). Quasi-experimental studies have also found similar improvements among non-adopted adolescents with Attention Deficit/Hyperactivity Disorder (Gardner et al., 2019). Additionally, long-term follow-up studies of PEERS have suggested that social skill gains are maintained over one to five years following the conclusion of the program (Mandelberg et al., 2014).

We felt that the PEERS program was a good fit for domestically and internationally adopted adolescents who were experiencing social skill and peer relationship difficulties given the focus PEERS places on the social skill domains of social communication, socio-emotional cue processing, social knowledge, and social problem solving, with the later including an emphasis on responding to experiences of teasing and bullying, as these are the very areas that have been identified as at risk among adopted adolescents. Additionally, including adoptive parents in the intervention allowed us to address post-adoption environmental factors, such as preparation to address adoptive and racial/ethnic micro-aggressions and encouraging parental emotional responsiveness, support, and boundary-setting, that may be playing a role in adopted adolescents' social functioning.

It was hypothesized that the PEERS program for adolescents would result in improvements in adopted adolescents' social-emotional functioning. Specifically, for measures completed by adolescent participants we expected improvements in social knowledge, friendship quality, satisfaction with social relationships, and self-concept, an increased number of peer get-togethers, and reductions in social anxiety and depression. For parent measures, we hypothesized that they would observe improvements in their child's social skills and empathy, an increased number of peer get-togethers, and reduced social anxiety symptoms in their child. Last, for teacher measures, we expected them to observe improved social skills within the school context.

Our second aim was to investigate whether predictors, such as gender of participant, age at adoption, time in adoptive home, verbal reasoning, or attachment disorder symptoms predicted the degree of improvement that participants displayed over the 16-week program. While past research identifies these predictors as related to social outcomes for adopted adolescents, there was no social skill intervention research among adoptees upon which to make firm, directional hypotheses, thus these analyses were viewed as exploratory.

Method

Participants

Following approval by the Institutional Review Board, participants were recruited through advertising at local middle and high schools as well as organizations that provide post-adoption social opportunities and support services for adoptive families. Participants were eligible if they were between the ages of 13 and 18 years old, were adopted, had a caregiver who was willing to attend the concurrent parent group, and had self and parent-reported difficulties with making or keeping friends. In total, 65 phone screenings were completed with interested families to determine eligibility and, of those, 55 completed in-person screening appointments. Ultimately, 50 adolescents enrolled in the program with 45 participants completing the 16-week program. The five participants who enrolled but did not complete the program left for a variety of reasons, including scheduling conflicts, mental health crisis, and because the adolescent decided the program was not a good fit after attending the initial session(s). Completers and non-completers did not significantly differ from each other on any of the demographic or pretest variables.

The 45 participants that completed the program included 28 females and 17 males (mean age = 14.4 years, $SD=1.76$). Thirty-three percent of the participants identified as Asian American, 24% as white, 24% as African American/Black, and 8% as Latinx/Hispanic. Sixty-four percent of the sample was internationally adopted, 29% were domestically adopted through foster care, and 7% were domestic private infant adoptions. Internationally adopted participants had been adopted from a range of regions including Asia ($n=13$, China, Thailand, Philippines), Eastern Europe & Russia ($n=5$, Ukraine, Russia), Africa ($n=3$, Ethiopia, Uganda), and Central and South America ($n=8$, Guatemala, Columbia, Guiana). The mean age at adoption was 4.82 years ($SD = 4.93$, Range = 1 month to 16 years) and participants had been in their adoptive home an average of 9.6 years ($SD = 4.92$, Range = 1–17.5 years) at the start of the program.

Adoptive families were headed by a single mother for 11% of the participants and by opposite gender, married couples in 89% of the sample. Household size ranged from 3 to 10 ($M=5.2$, $SD = 2.05$). Household yearly income distribution was as follows: <\$25,000 (2%), \$25,000–34,999 (7%), \$35,000–49,999 (9%), \$50,000–74,999 (20%), \$75,000–99,999 (22%), and >\$100,000 (40%). All adoptive parents of participants in the sample identified as white. All participants and their parents were asked to identify a teacher or coach who could complete pre-/post-questionnaires and ultimately data was collected for 38 participants from their classroom teachers or extracurricular coach/leader. There were no significant differences

between participants with and without teacher/coach data on any demographic variables.

Measures

Screening measures

Disinhibited social engagement and reactive attachment disorder symptoms. The Reactive Attachment Disorder and Disinhibited Social Engagement Disorder Assessment Interview (RaDA, Lehman et al., 2020) is a semi-structured interview for caregivers including 20 items, 9 that assess symptoms of disinhibited social engagement disorder and 11 that assess symptoms of reactive attachment disorder. The RaDA was modified from the Child and Adolescent Psychiatric Assessment—RAD assessment (CAPA-RAD, Angold et al., 1995), updating it to correspond to DSM-5 diagnostic criteria (APA, 2013) and modifying items to better capture symptoms in adolescence. Based on caregiver responses, each item is scored as 0 (Symptom Absent) or 2 (Symptom Present), with three DSED items allowing a score of 3 (Symptom Present and parent/caregiver regards as a problem). Total scores can range from 0 to 21 on the items assessing disinhibited social engagement and from 0 to 22 on items assessing reactive attachment disorder symptoms. Initial research with the RaDA suggests the measure has good reliability and validity (Lehman et al., 2020; Archambault et al., 2019). In the current study, internal reliability was acceptable for both DSED items ($\alpha = .79$) and for RAD items ($\alpha = .78$)

Verbal reasoning. The subtests of Vocabulary and Similarities on the Wechsler Intelligence Scale for Children—V (WISC-V; Wechsler, 2014) or the Wechsler Adult Intelligence Scale—IV (WAIS-IV; Wechsler, 2008), depending on the participant's age, were administered to assess verbal reasoning. The Vocabulary subtest requires participants to generate definitions for a list of words that are read to them by the examiner. The Similarities subtest consists of the examiner providing two words to the participant, who must then describe how the words are alike (i.e., “both animals”). Raw scores for each subtest were transformed to standardized scores ($M = 10$, $SD = 3$) using age-based norms and an average of the two subtests' standardized scores was used in the current study.

Teen-completed pre-/post-measures

Social knowledge. The Test of Adolescent Social Skill Knowledge (TASSK; Laugeson & Frankel, 2010) is a 30-item measure developed by the creators of the PEERS intervention to assess knowledge about the social skills and situations covered during the intervention. Each item includes a sentence

stem and participants much choose the best response from two potential answers. Scores can range from 0 to 30, with higher scores corresponding to better social knowledge. The internal consistency of the scale at post-test was good ($\alpha=.80$).

Peer get-togethers. The Quality of Socialization Questionnaire (QSQ-A; Laugeson & Frankel, 2010) was used to assess the number of peer get-togethers that the adolescent had hosted and been invited to over the previous month. The QSQ-A includes instructions that a get-together is “any time that teens follow through with a commitment to meet together after agreeing on a place and time” and asks participants to separately provide the number of get-togethers they hosted and were invited to in the past month, including providing the first names of teens involved. A total number of hosted and invited get-togethers in the past month were used separately in the current study.

Friendship quality. The Friendship Quality Scale (FQS; Bukowski et al., 1994) is a 23-item measure that asks participants to identify their closest friend and then answer a series of questions about the relationship (i.e., “My friend thinks of fun things to do together”). Items correspond to 5 subscales: Companionship, Conflict, Helpfulness, Security, and Closeness, and are rated on a 5-point Likert scale from *Not True* to *Really True*. A total score is calculated following the reverse scoring of the items measuring conflict, such that higher total scores indicate a higher quality friendship with their closest friend. The FQS has demonstrated good internal consistency in past research (Bukowski et al., 1994) and in the current study ($\alpha = .88$).

Self-concept. The Piers Harris-3 (Piers et al., 2018) consists of 58-items assessing how participants feel about themselves across six domains: Behavioral Adjustment, Freedom from Anxiety, Happiness and Satisfaction, Intellectual and School Status, Physical Appearance and Attributes, and Social Acceptance. Participants rate each statement with *Yes* or *No* and, following reverse scoring of items to ensure that higher scores indicate more positive self-concept, scores were transformed to T-scores ($M=50$, $SD = 10$) using age-based norms. The Total Score, which is a measure of participant’s overall self-concept across the domains assessed, was used in the current study.

Social satisfaction. The Loneliness and Social Dissatisfaction Scale (L & SD, Asher et al., 1984) is a 24-item measure, 8 of which are filler items included to disguise the purpose of the measure and 16 of which are used

for scoring purposes. The measure includes items that assess loneliness, social adequacy, and subjective evaluations of peer status. Participants rate each statement on a 5-point Likert scale from *Not True at All* to *Always True*. A total score is calculated from the 16 items, following reverse scoring of 6 of the items. Total scores can range from 16 to 80, with higher scores reflecting greater social satisfaction. Past research has found evidence of good reliability and validity for the scale (Asher et al., 1984) and internal consistency was good in the current study ($\alpha = .80$).

Social anxiety. The Social Anxiety Scale-Adolescents (SAS-A; La Greca, 1998) is an 18-item scale that assesses self-rated social anxiety symptoms, including items assessing fear of negative evaluation and social avoidance and distress in general as well as in new situations. Participants use a 5-point Likert scale for their responses that ranges from *Not at All* to *All the Time*. Total scores can range from 18–90, with higher scores indicating higher levels of social anxiety. Research with the scale indicates good reliability (La Greca, 1999) and validity (La Greca & Lopez, 1998) and internal consistency was also good in the current study (.94).

Depression. The Child Depression Inventory – 2 (CDI-2; Kovacs, 2011) is a 28-item screening tool that assesses symptoms of depression within four domains: Negative Mood/Physical Symptoms, Negative Self-Esteem, Ineffectiveness, and Interpersonal Problems. Participants choose one response among three provided choices for each symptom (i.e., I am sad once in a while, I am sad many times, or I am sad all the time). Following reverse scoring, a Total raw score is converted to a T score using age-based norms ($M=50$, $SD = 10$), with T-scores above 65 indicating an elevated level of depression symptoms.

Parent and teacher completed pre-/post-measures

Social skills. Parents and teachers both completed two measures to assess adolescent participant's social skills, the Social Skills Improvement System Rating Scales (SSIS, Gresham & Elliot, 2008) and the Social Responsiveness Scale – 2 (SRS-2, Constantino & Gruber, 2012). The SSIS is a multi-informant measure commonly used to screen for social skill difficulties and assess outcomes following social skill training interventions, with 79 items on the Parent form and 83 items on the Teacher form. Items assess the domains of Social Skills (including subdomains of communication, cooperation, assertion, responsibility, empathy, engagement, and self-control) and Problem Behaviors (externalizing, bullying, hyperactivity/inattention, internalizing, and symptoms of autism). Additionally, the Teacher form assesses the domain of Academic Competence. Items such as “takes turns

in conversation” are rated on a 4-point Likert scale from *Never* to *Almost Always*. Raw scores are transformed to Standard Scores ($M=100$, $SD = 15$) using age-based norms, with high scores for the Social Skills index representing better social functioning and lower scores on the Problem Behavior index indicated better behavioral and emotional functioning.

The SRS-2 is a 65-item measure that assesses social communication, reciprocity and behavioral rigidity. While it is primarily used in the context of assessment of symptoms of autism, the SRS-2 has been shown to be sensitive to the improvements in social functioning following the PEERS intervention (Laugeson et al., 2012). Items (i.e., “has difficulty making friends, even when trying their best”) are rated on a 4-point Likert scale from *Not True* to *Almost Always True*. Using gender-based norms, responses are transformed to T-scores ($M=50$, $SD = 10$) with scores above 60 representing elevated difficulties with social functioning (60–65 Mild, 66–75 Moderate, ≥ 76 Severe).

Empathy. The Empathy Quotient (Baron-Cohen & Wheelwright, 2004) is a 40-item, caregiver-rated measure of empathy, assessing the domains of cognitive empathy, emotional reactivity, and social understanding. Parents rated their adolescent’s empathic skills on items, such as “my son/daughter can tell if someone is masking their true emotion” or “my son/daughter can sense if he/she is intruding, even if the other person doesn’t tell him/her.” Responses were on a 4-point Likert Scale that ranged from *Strongly Agree* to *Strongly Disagree*. Following reverse scoring, a total raw score is calculated with higher scores indicating a better ability to express empathy. Internal consistency for the scale in the current study was good ($\alpha = .84$) and past research has suggested high internal consistency and test-retest reliability (Baron-Cohen & Wheelwright, 2004)

Peer get-togethers. Parents completed the Quality of Socialization Questionnaire—Parent (QSQ-P, Laugeson & Frankel, 2010) which is identical to the measure that adolescents completed. The number of hosted and invited get-togethers in the last month reported by parents was used in the current study.

Social anxiety. The Social Anxiety Scale—Parent (SAS-P; La Greca, 1998) is an 18-item scale that assesses parent-rated social anxiety symptoms among the adolescent participants. It mirrors the self-rated measure that adolescents completed that is described above. As with the self-rated measure Total scores can range from 18–90, with higher scores indicating higher levels of social anxiety. Internal consistency of the scale in the current study was good ($\alpha = .90$).

Procedure

Initial recruitment for the study began in Fall 2019, following advertising at local schools and post-adoption support and service organizations. Interested individuals contacted the lead investigator and brief phone screenings were conducted to assess for eligibility criteria, gather basic demographic information, and explain the intervention program to the families. Following phone screenings, in-person screening appointments lasting approximately 30 minutes were conducted. During these appointments, after the completion of the informed consent and assent process, parents completed the RaDA with the lead investigator while adolescents completed the WISC-V or WAIS-IV subtests with a research assistant. At the conclusion of the in-person screening, adolescent participants and their parents were provided with a packet containing the teen and parent pretest questionnaires and were asked to complete them and return them via the mail. Parents also provided the contact information for a teacher, who was contacted separately by the lead investigator to complete teacher pretest questionnaires (SSIS and SRS-2). Teachers were intentionally not provided information about the specific goals of the program or session content and were told only that their student was enrolled in a program for adopted adolescents and their ratings would be used to evaluate the impact of the program. Further, teachers were asked to complete all sections of the measures, which included academic and behavior topics in addition to social functioning, with the hope that pretesting would not sensitize teachers to the specific goals of the program.

Ultimately, a total of 15 participants enrolled in Cohorts 1 ($n=7$ teens) and 2 ($n=8$ teens) of the study and these groups were run concurrently, meeting for 90 minutes once a week for 16 weeks, with a team of 5 therapists, all of whom were certified in the PEERS intervention, and 6 research assistants. Each Cohort included an adolescent group and a parent group that met simultaneously, though in separate rooms. Briefly, the adolescent group meetings consisted of homework review, didactic presentation of the social skill assigned to a given week, followed by behavioral rehearsal activities and assignment of homework. In the current study, the adolescent group followed the PEERS manual for the delivery of the content though did discuss adoption-relevant examples when they were relevant to the topic (i.e., discussing adoptive microaggressions during the teasing and bullying lessons; identifying ways that behaviors in response to trauma triggers could impact reputations at school). The parent group meetings consisted of homework review with the goal of equipping parents to become social coaches for the teens in the home and community, a didactic portion addressing a specific social skill, and assignment of homework. While the PEERS manual was followed closely for the parent sessions, the

open-ended nature of the homework review time did allow frequent discussion and problem-solving regarding the ways that parents noticed that adoption, and in some cases histories of abuse and neglect, were impacting their teens' social functioning. At the conclusion of the groups, adolescents and parents reunited for a brief review by the lead therapist and individualized check-outs with a member of the intervention team to address any individual issues and confirm plans for homework completion for the coming week. See Laugeson et al. (2012; 2012) for a more detailed description of the PEERS intervention. Cohorts 1 and 2 were able to complete 10 weeks of the intervention prior to the onset of the COVID-19 pandemic and completed the final 6 weeks via tele-health, following the guidelines for tele-health provided by the UCLA PEERS team (Laugeson, 2020).

Recruitment, screening, and pretest questionnaires proceeded similarly for Cohorts 3 & 4, beginning in the summer of 2020 with a total of 14 participants enrolling ($n=6$ in Cohort 3, $n=8$ in Cohort 4). One participant left the program after attending one session, reporting that he did not feel the program was a good fit for him. The remaining 13 participants completed the program in person, utilizing masks, social distancing, and symptom screening, with the exception of the final two sessions that were conducted via tele-health due to rising COVID-19 case counts in late fall 2020.

Recruitment, screening, and pretest questionnaires for Cohorts 5 & 6 began in winter 2021 with a total of 21 participants enrolling ($n=11$ in Cohort 5, $n=10$ in Cohort 6). Four participants discontinued the program after attending 1–3 sessions, one due to a scheduling difficulty, one because a mental health crisis necessitated hospitalization, and two participants who changed their mind about wanting to participate. Ultimately, 17 participants completed the program across Cohorts 5 & 6 and all meetings were held in-person with masking, social distancing, and symptom monitoring in place.

For all Cohorts, adolescent participants, their parents, and teachers were provided with the packet of post-test questionnaires at the conclusion of the 16-week program that were the same as those they completed prior to the intervention. Post-test questionnaires were completed within one week of the end of the intervention for each Cohort. Adolescent participants chose a prize (board game, sporting equipment, gift cards to entertainment venues) upon completion of their questionnaires and teachers were sent a \$10 gift card following return of their post-intervention questionnaires.

Data analysis

In order to evaluate the first aim of the study a series of paired samples t-tests were conducted comparing the pretest to post-test means for each

outcome to examine the impact of the intervention across adolescent, parent, and teacher completed measures.

For the second aim, a series of multiple regressions were run in order to examine the unique contributions of a variety of factors on the degree of improvement from pretest to post-test on each of the adolescent, parent, and teacher rated measures. The dependent variable in each regression was the post-test score of the particular outcome measure. Predictors were entered in two blocks, with the first block containing the pretest score of the given measure and the second block containing the following predictors: gender of participant, age at adoption, time in adoptive home, verbal reasoning (average of Vocabulary and Similarities), and RaDA DSED and RAD scores. Each of these predictors had been identified in past research as related to social outcomes among adoptees, thus we were seeking to explore if each of the factors were related to the degree to which participants responded to the intervention on any of the outcome measures.

Of note, analysis of teacher-report outcomes was based on the subset of the sample ($n=38$) that had completed pre-/post-measures, while analysis of the adolescent and parent outcomes was based on the full sample ($n=45$) that had all completed each pre/post-measure.

Results

Screening measures

Descriptive data for the RaDA and Verbal Reasoning measures are presented in [Table 1](#). Verbal reasoning was generally in the average range for the sample overall. Incidence of symptoms of Disinhibited Social Engagement Disorder (DSED) and Reactive Attachment Disorder (RAD) were relatively low to moderate in the sample overall, though there was a high degree of variability.

Outcome measures

Paired samples t-tests revealed that adolescent participants had statistically significant improvements in their social knowledge, reported an increased

Table 1. Descriptive data on screening measures ($n=45$).

	M	SD
RaDA DSED items	4.78	5.1
RaDA RAD items	8	5.88
Vocabulary subtest	8.89	3.04
Similarities subtest	9.09	3.36

Table 2. Comparison of pre- to post-results for outcome measures.

	Measure	Pretest <i>M</i> (<i>SD</i>)	Posttest <i>M</i> (<i>SD</i>)	<i>t</i>	<i>p</i>	<i>d</i>
Teen measures (<i>n</i> = 45)						
	Social Knowledge (TASSK Total Raw Score)	15.7 (2.98)	23.33 (3.52)	-12.87	<.001	1.96
	Hosted Get-togethers (QSQ-A Total Raw Score)	1.4 (2.26)	3.35 (3.5)	-3.86	<.001	0.59
	Invited Get-togethers (QSQ-A Total Raw Score)	1.07 (1.61)	1.74 (1.85)	-2.2	0.03	0.34
	Friendship Quality (FQS Total Raw Score)	89.81 (16.08)	94.76 (12.29)	-2.24	0.03	0.37
	Self-Concept (Piers-Harris-3 Total T-score)	44.24 (11.7)	49.74 (1.51)	-4.26	<.001	0.66
	Social Satisfaction (L & SD Total Raw Score)	58.63 (13.56)	63.44 (8.32)	-2.57	0.014	0.39
	Social Anxiety (SAS-A Total Raw Score)	47.79 (16.24)	42.21 (14.78)	3.05	0.004	0.47
	Depression (CDI-2 Total T-score)	59.64 (15.58)	53.52 (11.83)	2.72	0.009	0.42
Parent measures (<i>n</i> = 45)						
	Social Skills Improvement System (Total Standard Score)	77.68 (12.80)	85.66 (11.89)	-5.52	<.001	0.83
	Social Responsiveness Scale (Total T-score)	70.81 (10.32)	63.42 (8.31)	6.15	<.001	0.94
	Empathy (EQ Total Raw Score)	22.11 (7.67)	28.61 (11.22)	-4.76	<.001	0.72
	Hosted Get-togethers (QSQ-P Total Raw Score)	1.21 (2.16)	1.89 (2.21)	-1.55	0.13	0.23
	Invited Get-togethers (QSQ-P Total Raw Score)	.82 (1.45)	1.07 (1.48)	-0.83	0.41	0.13
	Social Anxiety (SAS-P Total Raw Score)	54.57 (14.87)	49.71 (11.45)	3.66	<.001	0.55
Teacher measures (<i>n</i> = 38)						
	Social Skills Improvement System (Total Standard Score)	91.08 (13.45)	96.55 (12.89)	-4.08	<.001	0.66
	Social Responsiveness Scale (Total T-score)	60.21 (11.89)	57.55 (11.56)	2.86	0.007	0.46

number of hosted and invited get-togethers with peers, reported higher friendship quality with their best friend, had a higher self-concept and were more socially satisfied at the conclusion of the intervention compared with pretesting. They also had significant reductions in their self-reported symptoms of social anxiety and depression from pre- to posttest (See Table 2).

Parent-rated measures revealed statistically significant improvements in parent's perception of adolescent's social skills (both on SSIS and SRS-2)

and empathy as well as reductions in social anxiety symptoms. In contrast to the reports by the adolescent participants, parent-report of the teens number of hosted and invited get-togethers with peers were not significantly higher at post-test compared with pretest.

Teacher-rated measures also revealed statistically significant improvements in adolescent social skills (both on SSIS and SRS-2) from pre- to posttest. Comparing parent and teacher ratings of adolescent social skills revealed that teachers rated teens as relatively more socially skilled than parents' ratings at both pretest and post-test, with a medium effect size improvement seen by teachers from pre- to posttest and a large effect size improvement from pre- to posttest for parents.

Predictors of improvement

Among the regressions examining teen-rated outcome measures, the pretest score was the sole statistically significant predictor of post-test outcome for the social knowledge (TASSK), social satisfaction (L & SD), friendship quality (FQS), self-concept (Piers Harris 3), number of hosted get-togethers (QSQ-A hosted), depression (CDI-2), and social anxiety (SAS-A) outcomes. However, for the regression examining teen reported invited get-togethers, higher verbal reasoning and fewer Disinhibited Social Engagement Disorder symptoms predicted a greater number of invited get-togethers at post-test, after controlling for number of invited get-togethers at pretest (see [Table 3](#)).

For parent-rated measures, higher teen verbal reasoning was a significant predictor of number of hosted get-togethers at post-test ([Table 3](#)), controlling for pretest hosted get-togethers. Similar to the finding in teens, for the regression examining parent-rated invited get-togethers, higher verbal reasoning predicting greater number of post-test invited get-togethers, though at the trend level ($\beta = .28, p=.10$). Additionally, greater symptoms of Reactive Attachment Disorder predicted worse social skills on the post-test Social Responsiveness Scale – 2, after controlling for pretest SRS-2 ratings ([Table 3](#)). All other regressions examining parent-rated measures, including social skills on the SSIS, empathy (EQ), and social anxiety (SAS-P) found pretest score to be the sole significant predictor.

For the regressions examining teacher-rated social skills outcomes we found that, for the SRS-2, greater RAD symptoms predicted worse social skills at post-test, after controlling for pretest scores ([Table 3](#)). Additionally, for the SSIS regression, fewer Disinhibited Social Engagement Disorder symptoms predicted better post-test social skills on the SSIS, controlling for pretest scores ([Table 3](#)).

Table 3. Regressions examining predictors of post-test outcomes (n = 45 for teen and parent outcomes, n = 38 for teacher outcomes).

Variable	Teen-rated invited get-togethers			Parent-rated hosted get-togethers			Parent-rated SRS-2			Teacher-rated SRS-2			Teacher-rated SSIS		
	B	SE	β	B	SE	β	B	SE	β	B	SE	β	B	SE	β
Intercept	1.78	2.67		-2.08	3.34		39.61**	11.65		8.03	10.41		21.35	12.51	
Pretest measure	.40*	0.16	0.35	0.03	0.16	0.03	.53**	0.12	0.66	.88**	0.07	0.9	.61**	0.11	0.64
Gender ^a	0.33	0.59	0.18	-0.74	0.74	-0.34	-1.36	2.30	-0.16	0.32	1.9	0.03	2.11	3.03	0.16
Age at adoption	-0.15	0.16	-0.38	0.06	0.2	0.12	-1.1	0.65	-0.66	-0.51	0.51	-0.22	1.35	0.83	0.54
Time in adoptive home	-0.21	0.15	-0.54	0.19	0.19	0.42	-0.79	0.65	-0.47	-0.54	0.51	-0.23	1.4	0.82	0.53
Verbal reasoning ^b	0.21*	0.1	0.33	0.26*	0.13	0.35	-0.26	0.37	-0.09	0.05	0.3	0.01	0.31	0.45	0.07
RaDA DSED	-0.12*	0.05	-0.33	-0.06	0.07	-0.15	-0.24	0.23	-0.14	-0.23	0.18	-0.1	-0.54*	0.26	-0.21
RaDA RAD	0.08	0.05	0.25	0.04	0.06	0.09	.42*	0.19	0.30	.64**	0.19	0.29	-0.32	0.27	-0.13
R ²			0.38*			.28*			.55**			.85**			.75**
ΔR ²			0.27*			.27*			0.11			.08*			0.10

Note. ^aMale = 1, Female = 2. ^bAverage of Vocabulary and Similarities subtests on WISC-V or WAIS-IV.

*p<.05. **p<.01.

Discussion

The current study sought to evaluate the impact of the Program for the Education and Enrichment Skills (PEERS; Laugeson & Frankel, 2010) for a group of adopted adolescents who were experiencing peer social difficulties. Consistent with our primary hypothesis, significant improvements were found across almost every domain assessed when comparing the pre- to posttest ratings of adolescents, parents, and teachers. The adolescent participants demonstrated improved social knowledge, numbers of peer get-togethers, friendship quality with their best friend, self-concept, and social satisfaction. They also displayed significant reductions in self-reported depression and social anxiety symptoms. Effect sizes for these improvements ranged depending on the outcome that was assessed, with the intervention having the strongest impact on the adolescent's social knowledge, self-concept, hosted get-togethers and depression symptoms (all medium to large effects, Cohen, 1988).

Parent ratings of their child's functioning were also largely consistent with our primary hypothesis, with significant improvements found on measures of social skills and empathy as well as reductions in social anxiety. Similar to teen ratings, the effect sizes were in the medium to large range (Cohen, 1988). Notably, although trending in the hypothesized direction, parent-rated number of hosted and invited get-togethers were not significantly improved. Observations from our research team suggest that this was likely related to the pandemic and public health orders that were in place during various portions of all of the cohorts. The discrepancies between adolescents' self-report of number of get-togethers and parent's report of get-togethers likely appeared as adolescents were including informal get-togethers that were organized by themselves or peers before, during, and after school, as well as virtually, that were not always known to the parents. In contrast, parents were generally focused on reporting in-person get-togethers that occurred in their home or the home of a friend, which were more limited due to the pandemic. Recent research supports the general premise that adolescents experienced a reduction in in-person social gatherings as a result of the public health orders during the pandemic and that in-person school and virtual opportunities provided an increased proportion of adolescents' social opportunities (Larivière-Bastien et al., 2022; Branje & Morris, 2021).

Also consistent with our hypothesis, teacher ratings revealed significant improvements in the adolescent's social skills that were observable in the school setting to raters who were unaware of the specific focus of the intervention. Teachers rated the adolescent's social skills more positively both before and after the intervention as compared to parent ratings. The effect size of the pre- to posttest improvement as rated by teachers was

in the medium range while parent-rated improvement in social skills was in the large range (Cohen, 1988). This echoes past research with adopted children which has found modest associations between parent and teacher ratings of social skills due to differences between the home and school context (Tan & Camras, 2011).

These results are largely consistent with, and in some cases exceed, what has been reported with the use of PEERS in the context of autism, including several studies that utilized randomized controlled designs. Specifically, our findings on adolescent self-reported and parent-rated measures are very similar to existing studies evaluating PEERS for individuals with autism (Chang et al., 2014; Laugeson et al., 2009, 2012, 2014, 2015; Mandelberg et al., 2014; Rabin et al., 2018; Yoo et al., 2014). The significant improvements demonstrated on teacher-rated social skill measures in the current study surpass the findings of previous research with PEERS for autism, which tend to find non-significant or small effects (Laugeson et al., 2012; Wyman & Claro, 2020) perhaps due to challenges that participants with autism had in applying increased social knowledge in “real-world” settings outside of treatment.

In summary, the results of our study suggest that PEERS may be a valuable intervention program for adopted adolescents experiencing social difficulties. Our study was the first to examine a manualized intervention for social skills specifically with adopted adolescents. It also builds on the small but growing literature (i.e., Gardner et al., 2019), suggesting that the PEERS intervention, though developed initially for individuals with autism, translates well outside of that context.

Predictors of outcomes

The current study also examined whether verbal reasoning, reactive attachment disorder (RAD) symptoms, disinhibited social engagement disorder (DSED) symptoms and demographic factors, such as gender, age at adoption, and time in adoptive home were related to the degree of improvement that participants, their parents, and teachers reported. These specific factors were selected because they had been shown, in past research, to be related to social functioning in adoptees. However, analyses were exploratory since no studies had examined their relationship to outcomes following social skills interventions among adoptees.

We found that demographic predictors were unrelated to level of improvement on any of our outcomes, after controlling for pretest score. This suggests that the intervention produced similar outcomes across gender and for a wide range of ages at adoption and time in the adoptive home. Additionally, verbal reasoning, RAD, and DSED symptoms assessed

at screening were unrelated to the level of change in participants' social knowledge, social satisfaction, friendship quality, self-concept, empathy, social anxiety, and depression. Again, this suggests PEERS may be helpful for a diverse group of adoptees.

In contrast to these findings, however, lower verbal reasoning was a predictor of less improvement in invited get-togethers as rated by teens and hosted get-togethers as rated by parents. Past research with children with language-based learning disabilities or intellectual disabilities suggest that they are perceived as less socially competent by peers and experience reduced reciprocity in peer relationships (i.e., Tipton et al., 2013). Additionally, typically adolescent social gatherings are increasingly centered around conversation and more verbally complex interactions (Newman Kingery et al., 2020). This may result in adolescents with poorer verbal reasoning skills receiving fewer invitations by peers and having fewer positive responses from peers when attempting to host get-togethers. These findings suggest that working with parents and adolescents to find appropriate sources of friends from which to draw on for hosted and invited get-togethers is particularly important when the PEERS intervention is used with adopted adolescents who have lower verbal reasoning skills.

In addition to verbal reasoning predicting peer get-togethers, more symptoms of DSED at screening predicted less improvement in invited get-togethers, as rated by teens, and less social skill improvement (SSIS measure) as rated by teachers. Also, more symptoms of RAD predicted less social skill improvement (on SRS-2 measure) for both parent and teacher ratings. Thus, the presence of RAD and DSED symptoms seemed particularly important to improvement in social skills and peer get-togethers variables across raters. There are a variety of reasons why this may be the case. First, we utilized a parent-assisted intervention in which parents were expected to provide out-of-session coaching, support, and accountability to the adolescent participants during homework completion activities. RAD symptoms could result in a more strained relationship between parent and child, making out-of-session coaching less successful. Second, the presence of RAD symptoms may reflect a broader barrier to engagement with peers that impacted adolescent's ability to practice social skills with peers. However, given that RAD symptoms were not predictive of other outcomes, such as peer get-togethers, social satisfaction, and friendship quality, this later explanation seems less likely. Third, the finding of DSED symptoms predicting less improvement in get-togethers and social skills as rated by teachers may be related to the relationship that DSED symptoms have with inhibitory control (Bruce et al., 2009). Children and adolescents who are more impulsive and hyperactive are generally rated less positively by peers (Grygiel et al., 2018) and thus may be less likely

to be invited to get-togethers and may experience more peer rejection in the classroom setting. Given these mixed findings, with RAD and DSED associated with some outcome variables and not others, more research is needed to examine the role of these symptoms on response to social skill interventions among adoptees.

Limitations

While the current study serves as an important first step in understanding ways to intervene when adolescent adoptees are experiencing social difficulties, several important limitations need to be acknowledged. Most notably, the impact of the pandemic on our ability to carry out the intervention as originally planned was significant. Public health orders enacted at various points during each cohort limited in-person gathering and access to extracurricular activities, which at times made it difficult for participants to carry out assigned homework, such as hosting get-togethers. Additionally, the use of masking in cohorts three through six limited full-face viewing during sessions that were addressing social cue processing. In order to address this we utilized resources provided to our research team by the UCLA PEERS laboratory that allowed us to continue to offer the intervention despite these limitations (i.e., virtual extracurricular activity suggestions, video versions of all role plays). Despite our best attempts, however, future intervention research will be helpful in replicating these findings in a period less marked by large-scale social isolation and uncertainty. At the same time, we hoped that continuing to offer the intervention through the pandemic, when opportunities for social interaction were so limited, provided a buffering of the negative impacts of isolation for our participants.

In addition to the limitations inherent in conducting research during the COVID-19 pandemic, several design limitations are also important to mention. First, the current study did not utilize a waitlist control group or other comparison group to address threats to internal validity. However, despite this, our findings and effect sizes are quite similar to randomized controlled designs utilizing a waitlist control group to investigate the efficacy of PEERS for autism (i.e., Laugeson et al., 2009, 2012, 2015; Rabin et al., 2018). Second, while we included outcome data from adolescents, parents, and teachers, we did not include observational measures of social functioning conducted by the research team. We attempted to address this by limiting teacher's knowledge of specific methods and goals of the intervention in order to decrease the impact of observer bias and demand characteristics on their ratings, however, direct observational measures would be a useful pre-/post-outcome measure for future research. Third,

data on longitudinal outcomes for our participants is not available, thus the long-term impact of the PEERS intervention on social functioning for adoptees is not yet known. Though limited, past research with PEERS in the context of autism does suggest maintenance of gains (Mandelberg et al., 2014) and our research team has a long-term follow-up study planned.

Last, limitations regarding our sample are also important to note. First, the generalizability of the sample is limited by the overrepresentation of international adoptees and white adoptive parents relative to the population. Second, for many participants, especially those who were internationally adopted, pre-adoption history and records were very limited which resulted in an inability to control for factors (such as abuse and/or neglect) that may also serve as predictors of level of improvement from pre- to posttest.

Summary

Adolescence is a developmental period marked by increasing reliance on peer relationships for social support and intimacy (Newman Kingery et al., 2020). These relationships provide opportunities to practice increasingly complex social skills necessary for social competence in adult relationships and are linked with longitudinal socio-emotional adjustment (Kamper-DeMarco et al., 2020) and resilience after early adversity (van Harmelen et al., 2017). Adopted adolescents, particularly those who experienced significant adversity prior to adoption and/or challenging post-adoption environments (i.e., adoptive and racial microaggressions), are at an increased risk for difficulties with making and keeping friendships (DeLuca et al., 2019; Tang et al., 2021). This is especially concerning, given the presence of elevated mental health risk among adolescent adoptees (Holmgren et al., 2020) and the aforementioned link between high quality social relationships and emotional health. Despite a large body of research examining social outcomes among adoptees, no research has systematically examined social skill interventions for adolescent adoptees. The current study utilized the parent-assisted PEERS intervention (Laugeson & Frankel, 2010), demonstrating improvements across a wide range of outcomes as rated by adolescent participants, their parents, and teachers. Exploratory analyses suggested that level of improvement was unrelated to demographic factors, such as gender, age at adoption, and time in adoptive home. Additionally, most outcomes, with the exception of get-togethers and social skills as rated by parents and teachers, were also unrelated to participant's verbal reasoning and RAD and DSED symptoms. While more research is needed, these findings suggest that the intervention could be helpful for a wide

range of adoptees. Clinicians implementing this type of program would be wise to direct more focused attention to participants with poorer verbal reasoning and whose parents report higher levels of RAD or DSED symptoms.

Disclosure statement

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