

Effects of PEERS[®] Social Skills Training on Young Adults with Intellectual and Developmental Disabilities During College

Behavior Modification

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Abstract

The Program for the Education and Enrichment of Relational Skills (PEERS[®]) was used to provide weekly social skills training to a group of 10 college students with intellectual and developmental disabilities (IDD) between ages 18 and 26 attending an inclusive residential postsecondary college program. Additionally, Circles curriculum was used to supplement the PEERS curriculum for teaching social relationship boundaries. An average of 12 sessions per semester of PEERS[®] training sessions were conducted over each academic year. The present study examines the impact of the program on social skills, friendship qualities, and conversational skills. Results showed increased social skill knowledge, friendship quality, and conversational skills from pretest to posttest intervention. In this paper, we discuss the training program, results, implications for practice, limitations, and future research needs.

Keywords

social communication, young adults, PEERS[®], circles, intellectual and developmental disabilities

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Establishing and maintaining meaningful friendships is arguably one of the most important facets of an individual's life. The ability to make friends is not only related to academic success and job satisfaction, but also to overall health, happiness, and self-esteem (Dunbar, 2018; Hartup, 1996; Neel & Fuligni, 2013; Parker & Asher, 1987; Pittman & Richmond, 2007; Sanchez et al., 2020; Siperstein et al., 1997; Wentzel et al., 2018). The complex skills involved with friendship development appear to come naturally to some, but for others are often challenging and elusive. Young adults with intellectual and developmental disabilities (IDD) have difficulty acquiring the skills necessary for high-quality friendships, and this in turn can adversely affect long-term employment success (Martorell et al., 2008; McVilly & Rawlinson, 1998; Tipton et al., 2013).

There are many possible explanations as to why young adults with IDD have a more difficult time making and maintaining friendships: They tend to be less socially engaged, identify "friends" as people with whom they spend a lot of time, and may not know how to interact well enough to maintain friendships (Emerson & McVilly, 2004; Jobling et al., 2000; Lippold & Burns, 2009; Sigstad, 2016; Wilson et al., 2017).

Being a good friend to another person requires a range of receptive and expressive communication skills, including some that are often subtle (e.g., nonverbal cues). Additional skills necessary to maintain friendships include the ability to manage conflicts, forgive others, keep secrets, and offer help to others in need (McVilly et al., 2006a, 2006b). While many of these skills are a focus of treatment programs throughout the early school-age years (e.g., Odom, 2000; Sukhodolsky & Butter, 2007), there is scarce information on effective treatment approaches during the transition to adulthood when relationships are more complicated. Nevertheless, friendships and positive relationships at this time are crucial for success in building social support networks, attending college, living inclusively in the community, contributing as productive members in their community, and maintaining competitive employment among their coworkers. Therefore, it is important to investigate interventions that might improve friendship related skills exhibited by young adults with IDD.

The Program for the Education and Enrichment of Relational Skills (PEERS[®]) is an evidenced-based curriculum that has been designed for use with preschoolers, adolescents, and young adults. PEERS[®] was originally developed in 2005 for use with adolescents experiencing social challenges, especially those on the autism spectrum (Laugeson et al., 2009). A strong evidence base has been established for PEERS[®] including studies with preschoolers, adolescents, and young adults (Gantman et al., 2012; Gardner et al., 2015; Karst et al., 2015; Laugeson et al., 2012, 2014, 2015 Matthews

et al., 2018). However, there is far less research for teaching social skills to young adults with IDD or more specifically those also attending college.

PEERS® uses a cognitive-behavioral approach with structured, teacher-directed lessons in a group format and engages social coaches with program participants to help them acquire and then generalize newly learned skills to other settings. Social coaching is intended to occur in natural social settings during “coachable” moments and is intended to aid with participants achieving their weekly socialization assignments, primarily helping them find a source of friends.

PEERS® training is conducted in weekly lessons that include four distinct components. The first component is homework review which promotes generalization and provides opportunities to practice skills learned from the previous week. The focus is on what is working and what is not working with troubleshooting for challenging issues. The second component includes a didactic lesson and role-playing demonstrations. Didactic lessons use concrete rules and steps to introduce a new skill in a way that participants can comprehend. More complex and abstract social behaviors are broken down into smaller steps so rules may be applied to assist with comprehension. Role-play demonstrations by group leaders further illustrate these rules and steps. Following each role-play, perspective taking questions are asked of participants to promote increased social cognition. The third component is behavioral rehearsal. During this part of the lesson, participants practice and repeat newly learned skills. The last component consists of a homework assignment for the upcoming week.

The original developers of PEERS® incorporated behavior management techniques that are used during lessons to maintain participant engagement. These include verbal praise, using participants’ names to redirect their attention when necessary, using peer pressure to encourage participation, and clearly stating expectations at appropriate times. In addition, Laugeson et al. (2009) suggested strategies for use with learners with IDD including slowing down the intervention, providing more opportunities for behavioral rehearsal, and simplifying the lessons. For this reason, the Circles curriculum (Walker-Hirsch & Champagne, 1991) was used as a supplemental resource that was incorporated throughout weekly lessons. This provided more concrete to abstract instruction to categorize and define levels of intimacy in social relationships (Gougeon, 2009; Tinney et al., 2015; Walker-Hirsch, 2002; Walker-Hirsch & Champagne, 1991).

When PEERS® sessions included information about different types of relationships, the Circles curriculum was used. Circles teaches social distance and levels of intimacy by using categories or levels that represent real-life relationships. Specifically, there are six color coded concentric circles

representing behaviors, feelings, and actions applicable to each level. For example, “self” is represented in the center of the circle and is labeled “purple private circle.” The “blue hug circle” surrounds the purple circle, is slightly larger, and represents very close relationships, such as family members or girlfriend/boyfriend interactions. The outermost circle, or furthest circle away from “self,” is the “red stranger circle” which represents community helpers or other strangers that do not talk to you or touch you. In addition to colors and target words, visuals are used to assist with conceptual understanding.

Several studies have demonstrated the effectiveness of the PEERS[®] program. Gantman et al. (2012) used the PEERS[®] for Young Adults program in a community setting with 17 participants with Autism Spectrum Disorder (ASD) ages 18 to 23 years. They found that the participants demonstrated significantly less loneliness and improved social skills knowledge, and that their caregivers reported significant improvements in overall social skills, social responsiveness, empathy, and frequency of get-togethers. In another study by Laugeson et al. (2015) with PEERS delivered in a community mental health setting, 22 participants with ASD ages 18 to 24 years improved significantly in overall social skills, frequency of social engagement, and social skills knowledge, and demonstrated significantly reduced ASD symptoms. At a 16-week follow-up, most treatment gains were maintained and some new improvements observed.

Similar findings were also found in a larger study with young adults with ASD and ID attending a work-oriented training program with a private school conducted by Wyman and Claro (2019). This study used pre and post testing of social etiquette knowledge, friendship engagement and teacher reported levels of social functioning in 63 students with ASD or IDD. Participants ranged in age from 16 to 21 and participated in a 16-week PEERS[®] school-based curriculum. All participants, in both ASD and IDD groups, reported significantly improved social etiquette knowledge, but only students in the IDD group reported significant improvements in friendship engagement. There were no significant improvements for either group for teacher reported levels of social functioning.

While PEERS[®] research has primarily focused on treatment outcomes for high-functioning individuals with ASD, there have been a few studies utilizing PEERS[®] for adolescents with ADHD. First, Gardner et al. (2015), studied 20 adolescents with ADHD who attended a 14-week university-based clinic program with 90-minute PEERS[®] sessions each week found improvement across several peer functioning domains, and reported that many participants initiated new friendships. Next, Hill et al. (2017), conducted a

community-based PEERS[®] program with five middle and high-schoolers diagnosed with ASD and some with ADHD to look at both social skills and anxiety. Using pretest and posttest data, they found significant progress was made in the individuals' understanding and implementation of social skills. In addition to the improvements made with social skills, it was found that two individuals who tested with clinical levels of anxiety before intervention later tested with non-clinical levels after intervention completed.

As the above studies have focused primarily on ASD and adolescence in clinical and community-based settings, there is a continued need to address social skills training for young adults with IDD with the additional modifications suggested from previous research delivered in more inclusive academic settings. Therefore, the purpose of the present study was to expand the existing literature by examining the effect of PEERS[®] on improving social skills, conversational language skills, and friendship quality exhibited by young adults with IDD enrolled in an inclusive post-secondary education (IPSE) program on the college campus where the study occurred. The hypotheses tested in this study were as follows:

1. Young adults with IDD in college would report increased quality of friendship.
2. Young adults with IDD in college would report an increase in social skill knowledge.
3. Young adults with IDD in college would demonstrate improvement in conversational skills.

Method

Participants

Prior to data collection, approval was obtained from the Institutional Review Board (IRB) for research with human subjects through the university where the study was conducted. Before beginning the study, the researcher explained and obtained necessary student consents (if participants are over age 18 and had been declared their own guardian) or parent consents and student assents if participants had not been declared their own guardians. Only participants with signed consents and/or assents were included in this study.

PEERS[®] training sessions included 10 young adults with IDD (six males, four females). The participants ranged in age from 18 to 26 years (see Table 1 for participants' demographic and descriptive information). All of them were students in the same college program and the PEERS[®] training sessions were offered as an optional weekly activity.

Table 1. Participant Demographic Information.

Participant (pseudonyms)	Age in years	Ethnicity and gender	Disability	IQ, Reading Grade Level (RGL)	General Language Ability (GLA)
Polly	21	Caucasian, female	Down syndrome, ID mild	IQ = 61, RGL = 3rd grade	Moderate severity
Cameron	20	Multi-racial, male	Adjustment disorder, anxiety, ID mild	IQ = 70, RGL = 3rd grade	No data available
Sarge	24	Caucasian, male	Dandy-Walker syndrome, cerebral palsy, borderline ID	IQ = 74, RGL = 3rd grade	No data available
Monty	20	Caucasian, male	Down syndrome, ID mild	IQ = 53, RGL = no data available	No data available
Shannon	18	Caucasian, male	Hydrocephalus, ID mild	IQ = 62, RGL = 4th grade	GLA = 71
Linda	20	Caucasian, female	ID mild	IQ = 64, RGL = kindergarten	No data available
Keyon	27	African American, male	ID moderate	IQ = 48, RGL = kindergarten	GLA = 40
Donald	22	Caucasian, male	Autism, ID moderate	IQ = 45, RGL = kindergarten-1st grade	GLA = 42
Arlene	19	Caucasian, female	Autism, ID mild	IQ = 62, RGL = 3 rd -4th grade	GLA = 1st % ile
Aleshia	19	African American, female	ID mild	IQ = 66, RGL = 4th grade	GLA = 61

Additional attendees at the sessions included five graduate-level Communication Sciences and Disorders (CSD) clinicians, 11 undergraduate students who were around the same age as participants serving as social coaches (five CSD majors, two math education, two psychology majors, one social work major, and one parks and recreation management major), one special education faculty member, and one CSD faculty member.

Settings

The IPSE program in which the participants were enrolled was a 2-year, on-campus residential certificate program at a public, regional university in a southeastern state in the United States. The 600 acre campus included almost 12,000 students. Participants' on-campus life was fully inclusive with no separate facilities, settings, housing or classes except for individual tutoring on specific skills students wished to learn.

On-campus support was provided to the students in the program by approximately 225 undergraduate students referred to as natural supports who facilitated college living on campus, attending classes, and engaging in social and recreational activities. Eleven of these students served as the social coaches for the PEERS[®] training sessions and helped the participants generalize the social skills to the broader campus.

All PEERS[®] training sessions occurred once a week in a typical college classroom with small groups of tables with a seat capacity for 30 students. The classroom also included a projector and desktop computer. Additionally, throughout the study, generalization opportunities occurred throughout the college campus (e.g., dining facilities, residence halls, classrooms, work environments) where the study occurred.

Experimental Design

For quantitative analysis, a one-group pretest-posttest quasi-experimental design was used (Shadish et al., 2002). Quasi-experiments are most likely to be conducted in field settings in which random assignment is difficult or impossible. They are often conducted to evaluate the effectiveness of a treatment. In a pretest-posttest design, the dependent variable is measured once before the treatment is implemented and once after it is implemented. This design lacks a comparison or control group, and thus threats to internal validity are possible. The design was used because all students in the IPSE program indicated a desire to participate in the PEERS[®] training leaving none available to form a comparison group.

Dependent Variables

Dependent measures used to test the hypotheses included (a) Friendship Qualities Scale (FQS), (b) Test of Adolescent Social Skills Knowledge (TASSK), and (c) Conversational Skills Rating Scale (CSRS). The FQS and TASSK have been used in previous research to assess the impact of PEERS[®] research. The CSRS has been added to assess the impact of PEERS[®] on conversational skills.

The *Friendship Qualities Scale* (FQS; Bukowski et al., 1994) assesses the participant's perceptions of the quality of his/her best friendships and was used to test Hypothesis 1 (increased quality of friendship). Previous research has noted that confirmatory factor analysis supported the structure of the measure, and comparisons between ratings by reciprocated versus non-reciprocated friends supported the discriminant validity of the measure (Bukowski et al., 1994).

The FQS has 23 items and requires about 15 minutes to complete. During the assessment, the participant is asked to respond to each item using a 1 to 5 scale, in which 1 means not true, 3 means somewhat true, and 5 means very true. Participants are instructed to identify a "friend" that they spend time with and to keep this friend in mind when completing the measure. An example of an item is, "My friend and I spend all of our free time together." Because of the cognitive level of our participants, the FQS was adapted to reduce the level of abstractness by using color coding and three possible response choices rather than five. Participants were given the options of red (1) which means not true, yellow (3) meaning somewhat true, and green (5) meaning very true. Additionally, the term "friend" was used instead of "best friend" because many participants indicated that they did not have a best friend or reported family members or social coaches as best friends.

The *Test of Adolescent Social Skills Knowledge* (TASSK; Laugeson & Frankel, 2010) was completed by participants to test Hypothesis 2 (improved knowledge of social skills). It consists of 30 items designed to assess the participants' knowledge about the specific social skills taught during the PEERS[®] intervention. Each item consists of a sentence stem with two possible answers, one correct, one incorrect. Total scores range from 0 to 30, with higher scores reflecting greater knowledge of the social skills taught in the session.

The *Conversational Skills Rating Scale* (CSRS) was used to analyze videotaped conversational language samples to test Hypothesis 3 (improvement in conversational skills). The videotaped samples consisted of an approximately 5-minute-long conversation between a participant and a social coach or graduate clinician in a quiet area. Conversations were developed around common interests among typical college peers. The CSRS was chosen

because of its ability to be applied in a variety of contexts (educational, clinical, research); its acceptable levels of internal consistency and concurrent validity, and its alignment with many of the communicative skills addressed in PEERS lessons, including use of gestures, eye-contact, asking questions, initiation of new topics, maintenance of a topic, nodding head in response to partner statements, and volume of speech (Spitzberg & Adams, 2007; Spitzberg & Hurt, 1987). The CSRS has been used in a variety of research studies with the most recent study completed by Brock et al. (2019). In this study, 55 undergraduate and graduate speech-language pathology students assessed video-taped conversational language samples of persons with aphasia using speech generating devices. They reported that the CSRS had acceptable levels of internal consistency and that it adequately measured discrete, micro-level markers of communication, such as fluency.

The CSRS (Spitzberg & Adams, 2007) contains 25 items and a scale using a five-point Likert response format ranging from inadequate (1) to excellent (5). The CSRS measures four aspects of communication: (a) attentiveness, (b) composure (e.g., assertive or confident), (c) expressiveness (e.g., gestural animation), and (d) coordination (i.e., interaction management). Previous studies indicate that the CSRS is internally consistent ($\alpha = .80$; Brundidge, 2002). Further, the inter-rater reliability correlation coefficient is above $r = .72$. Interrater reliability was calculated for conversational language samples and scoring using the CSRS. Two CSD graduate students who were unfamiliar with PEERS were trained by one of the authors in CSRS coding. The first trained graduate student viewed all 20 conversational samples and coded each one using the CSRS. The second graduate student viewed 5 (25%) randomly assigned conversational samples and coded each one using the CSRS for reliability. Interrater reliability for CSRS total scores was calculated at 95%.

Data Analyses

Data relevant to Hypotheses 1, 2, and 3 were all analyzed in IBM SPSS Statistics 26 using paired-sample *t*-tests. Hypothesis 1, that participants would report an increased quality of friendship, compared the pretest and posttest total scores from the Friendship Qualities Scale. Hypothesis 2, that participants would report an increase in social knowledge, compared the pretest and posttest scores on the TASSK. Hypothesis 3, that the participants would demonstrate improvement in conversational skills was tested using the conversational language samples collected and analyzed as pretest and posttest measures using the CSRS. Statistical power analysis and effect size calculations were performed using two-tailed, paired sample *t*-tests in GPower Version 3.1.

Procedures

Data collection. All assessments were administered before and after PEERS[®] training by trained graduate speech/language clinicians and undergraduate social coaches. Data were collected once during the beginning of the fall semester (pretest), before the training sessions began, and once at the end of the spring semester (posttest) after most sessions were completed. The students entering the program followed a cohort model; three were completing their second year and the remaining seven were completing their first year. The pretests and posttests were collected annually for each cohort at the beginning of fall semesters and the end of spring semesters. Approximately 1 hour was required to complete all assessments. Some participants were able to complete the testing in one session, but others required additional time with completion occurring in a subsequent session. Participants were able to request that items be read aloud if necessary. If this occurred, the trained clinicians and graduate students were instructed to only read items verbatim.

PEERS[®] sessions. Training sessions were held weekly throughout the 2016 to 2018 academic year for approximately 1 to 1½ hours. There was an average of 12 sessions per semester. Chapters and activities from two PEERS[®] manuals, PEERS[®] for Young Adults and PEERS[®] Curriculum for School-Based Professionals, were used as the basis of training. Activities from the materials were adapted to better fit the participants' ages (college students), learning needs (due to intellectual disability) and setting (living on a college campus).

The sessions ran throughout the 2016 to 2018 academic year with 10 participants present for each weekly session. This study included students beginning in the fall 2016 and fall 2017 cohorts with multiple points of analysis of their progress throughout this timeframe. Two of the three authors were present for all sessions, although most session activities were conducted by two graduate clinicians and an average of 9 to 11 undergraduate social coaches each session. The classroom set-up for the sessions included small tables that were arranged in a U-shape or in small groups depending on the lesson and activities. Instructional methods used included direct instruction, opportunities for practice, video modeling, games, use of Circles visuals, and role-playing activities. PowerPoint presentations were used to guide training session activities. Each session concluded with a homework assignment that required certain social behavior to be carried out or exhibited during the week. Table 2 displays an outline of themes and session objectives.

Table 2. Themes Covered in Weekly PEERS® Sessions.

Week(s)	Theme(s)	Session objective(s)	Modification(s)
1	Introductions	To familiarize with persons, setting, and time To complete pretesting	Pretest was color coded to be more easily identifiable (red, yellow, and red)
2	Starting conversations	To understand characteristics of good friendships and types of friendships To practice trading information with peers	Removed best friend from TASSK since this was a limitation in other studies Passed around objects for trading information and finding common interests (e.g., DVDs for favorite movies, markers for favorite color, CD for favorite music)
3	Maintaining conversations	To review rules for trading information and starting conversations To expand topics of conversation	Added visuals with age appropriate pictures and videos of the big ideas, color coding and symbols for examples and non-examples
4	Finding friends	To practice asking open-ended questions To find sources of friends: social activities, common interests, groups	Discussion of most current ways to find friends relevant to this generation
5	Giving compliments	To practice the who, what, where, when, and why of giving compliments	Made our own videos to do more video modeling of giving compliments and reflecting
6	Sense of humor	To review rules for appropriate use of humor To practice humor and watch for humor feedback signs	Added in TV sitcom clips to show sense of humor examples
7	Circle of friends	To review levels of friends: best friends, good friends, acquaintances, strangers/professionals	Circles was added to show types of relationships and talk, trust, touch for each
8	Dating etiquette	To understand that dating is a choice To discuss where to find potential partners to date	Added technology and additional role plays with repetition, sharing personal stories from social coaches of their own dating experiences
9	Relationships	To practice letting someone know you like them To understand and practice deep vs surface level conversations	Brought in a sexologist expert Expanded relationships more with social media and added in conflict resolution strategies

(continued)

Table 2. (continued)

Week(s)	Theme(s)	Session objective(s)	Modification(s)
I0	Review and outing	To practice and generalize skills learned throughout the semester	Chose a community outing and personalized awards were given (bowling, train rides, exploring downtown)
I1	Introductions; welcome back to new semester	To familiarize to new persons, setting, and time	Provided review games of previous fall semester topics in game format (Kahoot, Jeopardy)
I2	Review circle of friends	To review different levels of friends To put people in our lives into the different levels	Used circles mat and labeling for review
I3	Jobs and interviewing	To understand how to dress for an interview To practice behavior during an interview To practice asking and responding to questions during an interview	Dressing for impressing with job interview role plays
I4	Interviewing and role-plays	To practice appropriate behaviors, asking and responding to questions during practice interviews	Speed dating activity to practice interview skills with multiple people and different jobs
I5	Appreciation for friends Self-appearance	To identify what we like about friends To verbally express appreciation to our friends To understand why self-appearance is important to friendships	Used a variety of visuals and additional role-plays
I6	Valentine's day activity	To generalize previously learned skills, expressing appreciation	Wrote thank you cards to a variety of people

(continued)

Table 2. (continued)

Week(s)	Theme(s)	Session objective(s)	Modification(s)
17	Communication in relationships	To review deep vs. surface level communication To understand elements of relationships To connect deep vs. surface level communication to circle of friends	Gave scenarios and practice opportunities with different people they would communicate with at a deeper level
18	Humor	To review rules for appropriate use of humor To identify good vs. bad use of humor in video examples	Used TV shows to show humor along with the role plays
19	Friendships after graduation	To practice using appropriate humor To discuss different ways to connect with friends post-graduation	Social coaches added their own personal stories
20	Long-term friendships	To understand the effort needed to keep friends long-term To review types of friendships and circle of friends	Social coaches added their own personal stories
21	Post-testing/games	To review and practice skills learned throughout the semester	Used a variety of technologies to review such as Kahoot and quizizz
22	Post-testing/games	To review and practice skills learned throughout the semester	
23	Awards	To express appreciation to all participants for their participation	Gave out paper plate awards with personalized strengths of the students

A typical session began with an ice-breaker activity during which participants shared stories or comments about their week. This was followed by homework review which allowed participants to share what went well during the previous week as well as social strategies that were confusing or did not work well. Homework review also was used to stress key points and provide opportunities for practice of newly learned skills. Didactic lessons were presented to directly teach vocabulary and new concepts. Dialogue during didactic lessons were explicit with presentation of specific rules and steps containing “buzzwords” (words that represent a common language between young adults, social coaches, and graduate clinicians). The following is an example of a dialogue from PEERS[®] for one rule for trading information:

Graduate clinician: “One of the first rules for trading information is to ask the other person questions. You might ask them about their interest, their hobbies, or what they like to do on the weekend.”

Graduate clinician: “What are some common questions young adults might ask?”

Participants: Responses that may include questions about interests, weekend activities, movies, TV shows, videogames, sports, books, music, school, or work.

Graduate clinician: “Why is it important to ask the other person questions?”

Participants: Because this is how you discover their interest, hobbies, and likes; it helps you discover if you have common interests.

Role-plays and behavioral rehearsal followed didactic lessons with clinicians, social coaches, and participants practicing targeted skills. Hands-on activities, visuals, and video modeling were also incorporated to supplement learning. The Circles visuals were also posted in the room for participants to reference as needed within PEERS[®] sessions that taught about relationships. An example of a session lesson plan can be seen in Table 3. As seen in Table 3, a homework assignment was provided at the end of each session to encourage generalization of newly learned skills throughout the week.

After each training session with participants was completed, a debriefing meeting was held with social coaches, CSD graduate clinicians, and faculty members for approximately 30 minutes to discuss what went well, what needed improvement, and next steps.

Training and use of social coaches to promote generalization. Concurrent with the initiation of the PEERS[®] sessions, an independent study course was provided by the authors for the 11 undergraduate students who served as social

Table 3. Sample Lesson: Conversational Topics, Trading Information & Maintaining Conversations (60 minutes).

Objective(s)	Time	Dialogue	Participation
To practice trading information with an unfamiliar person	10 minutes	<p>Homework Review—starting conversations and trading information</p> <p>Graduate Clinicians ask participants the following questions:</p> <ol style="list-style-type: none"> 1. "How did you start the conversation?" 2. "What were your common interests?" 3. "What could you do with that information if you were going to hang out?" 	<p>Participants raise hands to respond to questions. Make sure each participant has an opportunity to share. Social coaches and graduate clinicians provide prompts as needed.</p>
To review rules for trading information	10 minutes	<p>Provide visual representations of rules to participants; match each rule to its visual representation</p> <ol style="list-style-type: none"> 1. Ask the other person questions 2. Answer your own questions 3. Find common interests 4. Ask follow-up questions 5. Share the conversation/do not be a conversation hog 6. Do not get too personal at first 	<p>Participants work with their social coaches/person sitting next to them to match rules to visual representations; prompts as needed by social coaches and graduate clinicians</p>
To review rules for starting conversations	15 minutes	<p>Graduate clinicians role-play an inappropriate scenario and ask participants what went wrong. Ask perspective-taking questions: What was that like for (name)? What do you think (name) thought of me? Is (name) going to want to talk to me again?</p> <p>Review rules for starting conversations</p> <ol style="list-style-type: none"> 1. Casually look over 2. Use a prop 3. Find a common interest-mention it 4. Trade information 5. Assess interest 6. Introduce yourself <p>Graduate clinicians role-play an appropriate scenario and ask participants perspective-taking questions. Participants practice and role-play with peers and/or social coaches</p>	<p>Participants encouraged to engage in role-playing "good" scenarios in front of large group. Prompts as needed. Refer to rules for starting conversations (listed on PowerPoint)</p>

(continued)

Table 3. (continued)

Objective(s)	Time	Dialogue	Participation
To introduce asking open-ended questions	15 minutes	Graduate clinicians describe open-ended questions as those where the answers are longer and can lead to more conversation. Compare with close-ended questions (yes/no). Graduate clinicians role-play and model at least two scenarios (one open-ended question with response; one close-ended question with response). Participants practice asking open-ended questions with the person sitting next to them. Return to large group discussion and ask for participants to share an open-ended question that they practiced with their peers	Participants and social coaches practice asking each other open-ended questions with prompts and modeling as needed Encourage sharing one of the questions in large group
Wrap up and assign homework	10 minutes	Briefly review rules for starting conversation, trading information, and asking open-ended questions. Homework assigned: Call a peer or social coach and practice a conversation with the three steps of starting the conversation, trading information, and asking at least two open-ended questions	Social coaches review homework assignment with participants as needed. Participants will be ready to share their conversations next week

coaches across Fall 2016 and Fall 2017 semesters. While the independent study course was only offered in Fall semesters, the final post test was conducted in Spring 2018. The course met twice a week in a classroom setting, once early in the week to plan the PEERS® training session without participants present, and once at the end of the week to implement the training session with participants. In addition to the planning and training times, the social coaches were required to work with participants for at least an hour a week to help participants generalize and practice PEERS® strategies outside of the weekly training sessions. This extra hour outside of the weekly training sessions was completed in various settings while completing a variety of typical college experiences in the participants' usual routines on campus to further promote the generalization of skills (e.g., attending club meetings, having a meal together, doing homework, active leisure).

The independent study course objectives broadly addressed students' knowledge and experiences of social and peer coaching, defined and identified friendship and social skills characteristics, provided research-based strategies from social skills curricula, and taught students to implement various formal/informal assessments while helping to generalize strategies within the social skills coaching context.

CSD graduate clinicians. Two master's level graduate clinicians in CSD were responsible for leading the activities during the PEERS® training sessions each semester. The students were required to complete 15 credits of supervised practicum experience as part of their graduate program totaling at least 400 contact hours. Because the PEERS® program focused on social language development, their participation in the training sessions allowed them to complete part of this requirement. During the sessions, the graduate clinicians were provided supervision and guidance by at least one member from the CSD Department who was also a faculty member with PEERS® certification and a clinical supervisor.

Results

For the first hypothesis, (increased quality of friendship) based on the FQS, in Table 4, total mean score increases from pretest to posttest intervention were obtained, but did not reach significance; pretest ($M=87.00$, $SD=8.00$) and posttest ($M=91.80$, $SD=6.61$); $t(9)=2.09$, $p=.06$. The p value of .06 approached trend levels of significance with a medium effect size calculated at .65.

The second hypothesis, (growth in social skill knowledge) assessed by the TASSK total scores, was supported by a significant difference between the

Table 4. Paired Samples Statistical Analysis of Pretest and Posttest Scores on the Friendship Qualities Scale, the Test of Adolescent Social Skills Knowledge, and the Conversational Skills Rating Scale.

Pairs	M	N	SD	SEM	t	df	p	d (size)
Friendship qualities scale								
Pretest	87.00	10	8.00	2.53	2.09	9	.06+	.65 (medium)
Posttest	91.80	10	6.61	2.09				
Test of adolescent social skill knowledge								
Pretest	14.10	10	2.68	.85	2.20	9	.05*	1.18 (large)
Posttest	16.90	10	1.85	.58				
Conversational skills rating scale								
Total score pretest	102.40	10	6.82	2.16	2.05	9	.07+	.73 (medium)
Total score posttest	108.00	10	8.29	2.62				
Attentiveness subscale pretest	25.30	10	2.50	.79	2.14	9	.06+	1.01 (large)
Attentiveness subscale posttest	27.50	10	1.43	.45				
Composure subscale pretest	26.50	10	2.46	.78	.68	9	.51	.22 (small)
Composure subscale posttest	26.00	10	1.89	.60				
Expressiveness subscale pretest	27.30	10	3.50	1.10	1.62	9	.14	.65 (medium)
Expressiveness subscale posttest	29.30	10	2.31	.73				
Coordination subscale pretest	23.30	10	3.89	1.23	1.29	9	.23	.49 (small)
Coordination subscale posttest	25.30	10	4.27	1.35				

Note. * $p < .05$; + $p < .1$.

pretest ($M=14.1$, $SD=2.68$) and the posttest ($M=16.9$, $SD=1.85$); $t(9)=2.20$, $p=.05$, as shown in Table 4. A large effect size was calculated at 1.18.

Finally, the third hypothesis, (improvement in conversational skills) as analyzed by the CSRS, total mean score increases from pretest to posttest intervention were obtained, but did not reach significance, pretest ($M=102.40$, $SD=6.8$) and posttest ($M=108.00$, $SD=8.29$); $t(9)=2.05$, $p=.07$, as shown in Table 4. The p value of .07 approached trend level of significance with a medium effect size calculated at .73. For the subscales of attentiveness, composure, and coordination, mean score increases from pretest to posttest intervention were noted but did not reach significance; attentiveness pretest ($M=25.3$, $SD=2.50$) and posttest ($M=27.5$, $SD=2.43$); $t(9)=2.14$, $p=.062$, $d=1.01$; expressiveness pretest ($M=27.30$, $SD=3.50$) and posttest ($M=29.3$, $SD=2.31$); $t(9)=.68$, $p=.51$, $d=.65$; coordination pretest ($M=23.30$, $SD=3.89$) and posttest ($M=25.30$, $SD=4.27$); $t(9)=1.28$, $p=.23$, $d=.49$. The composure subscale did not show a score increase from pretest to posttest intervention; composure pretest ($M=26.50$, $SD=2.46$) and posttest ($M=26.00$, $SD=1.89$); $t(9)=.68$, $p=.51$.

Discussion

This study extends previous PEERS[®] research and social skills training with a different population, young adults with IDD who were attending an IPSE and participating in a campus-wide social skills training. Findings of significant improvement in social skill knowledge are similar to those found by Laugeson et al. (2012, 2015) in their studies with adolescents and young adults with ASD, but differ in findings related to friendship quality. The results from this study did not reach significance for measures of friendship quality. These results are consistent with Wyman and Claro (2019) which found significance in participant social skill knowledge, but not for friendship quality in ASD and intellectual disability (ID) comparison groups. Similarly, they noted that students with ID were able to directly apply their social knowledge in academic settings as also found in this study.

The current study extended research with emphasis on social skills knowledge, conversational skills, use of video modeling and role-playing, with adaptation beyond ASD to individuals with IDD. This is a clear distinction from previous PEERS[®] research with all of the participants in this study presenting with IDD. Similar findings exist for video modeling and teaching social skills to individuals with customer service skills (Bross et al., 2019) and social safety skills to young adults with IDD (Spivey & Mechling, 2016). These skills continue to be important to teach explicitly at the college level.

The results for Friendship Quality were also consistent with previous studies with mean scores moving in the expected direction, but not obtaining significance (Gardner et al., 2015; Laugeson et al., 2015; Schohl et al., 2014). Schohl (2014) notes that this may be a domain which requires more time to develop. This may be explained by historical classroom segregation for individuals with IDD in academic settings. The social skills curriculum in this (and other) college programs might require different measures to assess changes in friendship quality, especially given its abstract nature. The FQS was revised for use in this study with a change from the requirement of a “best friend” to “friend.” Several participants noted that they do not have a best friend or they identify a teacher, parent, or social coach as a best friend suggesting the need for an alternate measure of friendship quality.

Conversational skills have not previously been evaluated in PEERS[®] research. In this study, scores obtained from the CSRS moved in the expected direction, but did not reach significance. Participants demonstrated improvement in three out of four behavioral skill clusters outlined in the CSRS. Many of the skills measured by the CSRS directly relate to PEERS[®] topics and weekly lessons. For example, initiating and exiting conversations and showing interest in a conversational partner with head nodding, maintaining eye-contact, and asking questions are behaviors which are frequently addressed in role-play scenarios. The behavioral skill cluster of composure (i.e., confidence, assertiveness, and relaxation) did not show improvement. These results may be similar to the overall findings for friendship quality in that this domain requires a greater amount of time to develop or it may be that the method of obtaining videotaped conversational samples needs refinement (i.e., conversational sample greater than 5 minutes in length, varying contexts and conversational partners). As this is the first study to measure conversational skills as an outcome of PEERS[®], there was not a solid relation established between the dependent variables.

Limitations

This study had a few limitations. First, self-report measures were used. There can be limitations as participants may lack the ability to self-reflect or understand the questions being asked or provide impulsive responses. College students with IDD may not have the nuanced language structures to successfully describe their experiences when presented with measures that directly rely on these complex language skills. The language sample provided observational measures for trained clinicians to also evaluate conversational and social skills at pretest and posttest measures. Second, the sample size and geographic area limits generalization of findings across disability groups and

regions. A statistical power analysis was performed for sample size estimation based on results and effect sizes from this study. With an $\alpha = .05$ and $\text{power} = 0.95$, the projected sample size needed is approximately $N = 33$ for friendship quality (FQS) and $N = 27$ for conversational skills (CSRS).

Future Research

The present study warrants continued research opportunities to the field. Future studies could include more direct involvement of family members, siblings, significant others, community members, and coworkers in weekly social skills training. This could help with increased practice and generalization of social and conversational skills in natural contexts. Expanding PEERS® lessons to different settings (e.g., work sites) could also be considered. As this study incorporated significant modifications and adaptations, such as Circles and visual supports, future research might investigate the effects of these supplements being used in combination with PEERS®. Additionally, research studies could also expand assessment measures beyond self-reporting and include more sensitive measures of the conversation samples. Furthermore, replication of studies could encompass larger disability groups and regions to include other learning disabilities, emotional/behavioral disorders, and traumatic brain injuries. Finally, future research could also include more long term follow up and maintenance of social skills interventions as this study did not account for additional follow up and maintenance.

Implications for Practice

There are several implications for practice based on the findings from this study. First, teaching social and friendship skills needs to happen across the lifespan and across all disabilities. Social skills interventions typically occur in the early school years while the critical years for social development have increasing importance starting in middle-school and beyond. There is also an emphasis on the relation of social skills to ASD; however, social skill deficits occur frequently with other disability populations and particularly college students with IDD. College is a wonderful place to also continue learning and practicing these social skills before fully entering the workforce. Second, use of supplemental modifications to PEERS®, such as role playing and video modeling, are effective in helping participants grasp difficult and often subtle social concepts (Olçay Gül, 2016). These techniques also increase motivation and interest in learning social concepts and help spark discussion about personal successes and failures with social and friendship skills. Third, there

were some necessary adaptations of PEERS® activities and teaching strategies when applying to individuals with IDD. These modifications include making abstract concepts more concrete by including frequent checks for understanding and visual supports, such as video examples, symbols, Circles concept, and vocabulary demonstration. Fourth, extending this training for long-term maintenance with additional audiences of young adults with IDD should be considered as development and use of social and friendship skills need frequent monitoring and practice. Fifth, there is a need to expand social skills curricula and interventions with additional relevance to upcoming generations. For example, some of the curricula used that explicitly teaches social skills can be irrelevant and quickly dated with the current generation. More specifically, additional emphasis can be placed on dating relationships as well as use of social media than what is currently available in social skills curricula. A suggested online module or intervention that would be interactive and live rather than videos that are pre-recorded and quickly become dated might be a good way to keep up with the times. To address this, during PEERS® sessions, some of the student role plays were recorded live and played back to reflect their skills learned with more relevant content.

Conclusion

Teaching social skills explicitly to all individuals can provide life-long benefits, including lasting friendships and increased success within inclusive communities and workplaces. It is imperative that social skills training be provided across the lifespan and with all disabilities. Utilizing already existing social skills treatment programs with various disabilities provides the outline and structure for practitioners to work together to modify as needed for their individual client or student needs. In this study, college students with IDD made significant progress with social skill knowledge and trended in the expected direction for friendship quality and conversational skills. To date, there are few social skill programs designed for college students with IDD and this study provides a good start in moving in the desired direction.


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