



Social Competence Intervention Program (SCIP): A pilot study of a creative drama program for youth with social difficulties

Laura A. Guli, PhD^{a,*}, Margaret Semrud-Clikeman, PhD^b, Matthew D. Lerner, MA^c, Noah Britton, MA^d

^a University of Texas at Austin, SZB 504, 1 University Station, D5800, Austin, TX 78712, United States

^b University of Minnesota Medical School, 420 Delaware St. SE, MMC 486, Minneapolis, MN 55455, United States

^c University of Virginia, Department of Psychology, 102 Gilmer Hall, PO Box 400400, Charlottesville, VA 22904-4400, United States

^d Bunker Hill Community College, 250 New Rutherford Avenue, Boston, MA 02129, United States

ARTICLE INFO

Keywords:

Social skills
Autism
Asperger's
Group
Treatment
Drama

ABSTRACT

This study explored the effects of participation in the Social Competence Intervention Program (SCIP), an innovative creative drama-based group intervention, of children diagnosed with autism spectrum disorder (ASD), nonverbal learning disability (NLD) and/or attention deficit hyperactivity disorder (ADHD). Eighteen participants in SCIP were compared to a clinical control group of 16 on changes in measures of social perception, social competence, and naturalistic observed social behavior. Hierarchical multiple regression model was used for all primary quantitative analyses. Interviews were conducted post-treatment to provide qualitative data. The treatment group showed significant improvement in key domains of observed social behavior in a natural setting compared to the clinical control group. Parents and children in the SCIP condition reported multiple positive changes in social functioning. These findings provide preliminary support for the use of a creative drama program for children with social competence deficits related to social perception problems.

© 2012 Elsevier Inc. All rights reserved.

Introduction

Deficits in social competence, or the ability to function effectively in interpersonal situations and perform competently on social tasks, are a defining characteristic of youth with autism spectrum disorder (ASD; Koenig, De Los Reyes, Cicchetti, Scahill, & Klin, 2009). Social competence difficulties have been documented not only in youth with ASD, but those with a nonverbal learning disability (NLD), and attention deficit hyperactivity disorder (ADHD), as well (Little & Clark, 2006; Woodbury-Smith & Volkmar, 2009). A key element necessary for social competence is social perception, defined as the ability to identify, recognize, and interpret the meaning and significance of the behavior of others (Lipton & Nowicki, 2009). The process of social perception can be broken down into the input of sensory cues, integration of these cues and output of an appropriate behavioral response (Johnson & Myklebust, 1967). Children and adolescents with ASD and NLD have difficulty with each of these steps (Rourke, 1995; Semrud-Clikeman, Walkowiak, Wilkinson, & Minne, 2010; Woodbury-Smith & Volkmar, 2009).

Specific deficits have been found in these populations' ability to accurately decode facial cues, voice tone, and/or prosody (Deruelle, Rondan, Gepner, & Tardif, 2004). Research has also begun to identify attention issues in children with ASD and NLD (Fine, Semrud-Clikeman, Butcher, & Walkowiak, 2008) as well as social perceptual difficulties in children with ADHD (Corbett & Constantine, 2006). Emerging evidence is present in the literature that ADHD and ASD may share not only common behaviors but also a common deficit in the frontostriatal pathways as a basis of their disorders. Thus, it has been strongly suggested that studies include children with ADHD as well as those with ASD within the same groups for intervention (Corbett, Constantine, Hendren, Rocke, & Ozonoff, 2009). Empirical studies indicate that while inattention relates to social functioning difficulties (Fine et al., 2008), a more fundamental variable underlying these social skills difficulties is deficits in social perception (Semrud-Clikeman et al., 2010).

Social skills interventions

Though many social skills interventions exist, many programs have demonstrated inconsistent efficacy in addressing the social competence needs of children with ASD, NLD, and/or ADHD (Matson, Matson, & Rivit, 2007). These populations may benefit from social skills programs that are experiential rather than didactic, and developed for their specific needs (Davis & Broitman, 2011; Koenig et al., 2009; Lerner & Levine, 2007). It has been

* Corresponding author at: 3625 Manchaca Rd., Suite 202, Austin, TX 78704, United States. Tel.: +1 512 522 4093; fax: +1 512 685 1514.

E-mail addresses: laura@drilauraguli.com, mdl6e@virginia.edu (L.A. Guli), semrudcl@msu.edu (M. Semrud-Clikeman), mlerner@virginia.edu (M.D. Lerner), noahbritton@gmail.com (N. Britton).

recommended that interventions for ASD and NLD focus on sharing relationships, and break down complex social behaviors into concrete steps (Kransny, Williams, Provencal, & Ozonoff, 2003). In recent years, various interventions targeting ASDs and related disorders have emerged that emphasize social-cognitive, relationship building and social perception skills. While promising findings using these skills have been found, they often used very small samples, failed to employ controlled group designs, and have yielded often inconsistent results (see Lerner, Hileman, & Britton, *in press*; Matson et al., 2007).

Drama as effective intervention

An increasing number of scholars are realizing that drama therapies may be well suited to ASD and related populations. Several programs using drama therapies are currently being used with children with ASD and have gained notoriety as treatments for social difficulties, including programs developed by Loretta Gallo-Lopez (www.playandcreativetherapy.com/services/actproject) and Lee Chasen (Chasen, 2011). More specifically, some have considered whether drama activities (rather than entire drama therapy programs), may have unique efficacy for remediating social challenges. Drama activities are interactive, emphasize relationships, emotions, communication, cooperation and imagination, in-context learning, and emphasize the give and take of interpersonal nonverbal cues (Spolin, 1986). A number of studies have already used drama successfully to address various aspects of social competence (de la Cruz, Lian, & Morreau, 1998; Goldstein & Winner, 2012; Lerner & Levine, 2007). Drama activities have been promoted specifically as an intervention for ASD and related disorders because they effectively address social-cognitive processes, emphasize relationships and tap into social perceptual abilities (Attwood, 2007; Sherratt & Peter, 2002; Warger, 1984). In fact, many drama activities and games in the public domain originally developed as means for actors to become skilled in reading each other's nonverbal cues for the stage, and thus directly address the social perception difficulties experienced by children with ASD, NLD, and ADHD (Schneider, 2007). Few controlled research studies have examined the use of drama activities with these populations.

Recently, Socio-Dramatic Affective Relational Intervention (SDARI; Lerner, Mikami, & Levine, 2011), a program using some creative drama techniques, was developed on the principle that children with ASD will benefit from programs that are highly motivating and focused on relationships. Pilot study results indicated generalized, maintained gains for participants in social assertion, the ability to accurately perceive nonverbal social cues (Lerner et al., 2007), as well as faster increases in within-group peer liking and interaction relative to a more traditional model (Lerner & Mikami, 2012). However, studies of SDARI have used relatively small samples (<10 participants/condition), have not examined changes in peer interaction in naturalistic settings, have only used ASD participants, and do not use a pure creative drama approach. Similarly, a modified and abbreviated version of the Social Competence Intervention Program for children aged 6–8 (SCIP; Guli, Wilkinson, & Semrud-Clikeman, 2008) resulted in positive outcomes in a qualitative study (Minne & Semrud-Clikeman, *in press*). All child participants demonstrated improvements in social interactions as measured by parent report post-intervention. The program used play therapy and sociodramatic play as the primary therapy modality.

Current study

The purpose of this study was to evaluate the efficacy of the full and manualized version of the Social Competence Intervention Program (SCIP; Guli et al., 2008). SCIP is a manualized creative

drama intervention program designed for use with children with ASD and NLD. Our first hypothesis was that the participants, relative to a population-matched comparison group of youth who did not receive the intervention, would display improved parent-reported social functioning at the end of the intervention period as measured by a standardized rating scale. Second, we hypothesized that SCIP participants, relative to the comparison group, would display decreased errors in receptive nonverbal cue reading on an objective computer-based task at the end of the intervention. Third, we hypothesized that a subsample of SCIP participants would improve in observed naturalistic social interaction relative to the comparison group, indicating generalization of improved social skills to non-clinical settings. Finally, we hypothesized that improvements in participants' social competence would be reflected in parents' and participants' perceptions as indicated in post-treatment interviews.

Methods

Participants

Thirty-nine youth (31 male), 8–14-years-old ($M = 10.97$), participated. Nineteen children had a diagnosis of ASD that had been provided by a licensed community psychologist following a comprehensive neuropsychological evaluation. Nine children were previously diagnosed with NLD following a comprehensive neuropsychological evaluation conducted by community neuropsychologists. Eleven children had a primary diagnosis of ADHD based on DSM IV-TR criteria (APA, 2000). Thirty participants (76.9%) with ASD or NLD were reported by parents to have a comorbid diagnosis of ADHD and 20 (51.3%) were reported to take prescription medication. Thirty-six participants (92%) were Caucasian, two were Hispanic, and one was African-American. The participants were of middle to upper class socioeconomic status and attended numerous schools in and around a major southwestern American city. While all participants provided informed consent, children were unaware of the hypotheses being tested.

Inclusion criteria were (a) overall intelligence above 80 (range 80–122) as measured by the Kaufman Brief Intelligence Test (KBIT, Kaufman & Kaufman, 1990) or the Wechsler Intelligence Test for Children, Third Edition (WISC-III, Wechsler, 1991), and (b) evidence of social competence difficulties documented by either previous diagnosis of ASD or NLD by a licensed psychologist or neuropsychologist, or a primary diagnosis of ADHD along with significant deficits as indicated on the Social Skills Ratings System (SSRS; Gresham and Elliott, 1990; see below). Exclusion criteria were the presence of a history of head injury, psychosis, oppositional defiant disorder or conduct disorder, and a primary spoken native language other than English.

The first 23 children meeting all inclusion and exclusion criteria were assigned to the treatment group on a consecutive, rolling entry basis, in order to best serve the needs of the community, yielding a pseudo-random assignment procedure. Participants were referred by parents, school district personnel, and a neurological clinic in the community in a large southwestern city in the U.S. Five participants dropped the program early, one of whom was placed in the clinical comparison group. All of the participants who dropped out of the intervention program had a primary diagnosis of ADHD. After attrition, the intervention group ($n = 18$) contained 11 children with a primary diagnosis of ASD (7 of whom had a secondary diagnosis of ADHD), 2 with a primary diagnosis of NLD (both of whom had a secondary diagnosis of ADHD), and 5 with a sole diagnosis of ADHD (see Table 1).

Children were assigned to the comparison group consecutively with attempts to match for age, gender and cognitive ability. Participants in this group included children placed on a waitlist for

Table 1
Baseline measures between groups (after attrition).

	Clinical control group	Treatment group	Baseline group difference
Gender ^a	13 male	15 male	.03 (.874)
Primary diagnosis ^a	7 ASD, 6 NLD, 3 ADHD	11 ASD, 2 NLD, 5 ADHD	3.28 (.194)
Medication status ^a	4 yes	12 yes	5.90 (.015) [*]
Age (months)	133.00 (24.63), 16	125.28 (23.05), 18	-.94 (.352)
IQ	104.17 (15.47), 12	107.50 (14.04), 18	.61 (.546)
Social skills rating system	71.75 (11.31), 12	78.05 (15.98), 17	1.17 (.251)
DANVA2 – faces	3.15 (1.86), 13	5.22 (2.71), 18	2.37 (.025) [*]
DANVA2 – voices	6.62 (2.63), 13	7.28 (3.44), 18	.58 (.566)
BASC – withdrawal	59.93 (14.01), 15	64.17 (17.14), 18	.77 (.449)
BASC – social skills	33.33 (11.07), 12	35.29 (9.95), 17	.50 (.62)
Observed positive interactions	12.56 (10.91), 9	12.25 (10.21), 8	-.06 (.953)
Observed solitary behaviors	19.89 (14.42), 9	17.63 (14.08), 8	.33 (.748)

^a Simple counts. Numbers in table are raw group means with standard deviations in parentheses followed by *n*'s. In the baseline group difference column, *t*-test or *chi*-square value and associated *p*-value (in parentheses) for the significance of the difference between the baseline means is listed.

^{*} *p* < .05.

treatment, those who could not participate due to scheduling difficulties, and children who dropped after two or fewer sessions, a procedure that has been used in other treatment studies (McCloskey, Noblett, Deffenbacher, Gollan, & Caccaro, 2008). The comparison group (*n* = 16) included 7 children with a primary diagnosis of ASD (3 of whom had a secondary diagnosis of ADHD), 6 with a primary diagnosis of NLD (5 of whom had a secondary diagnosis of ADHD), and 3 with a sole diagnosis of ADHD (see Table 1).

Measures

SSRS (Gresham and Elliott, 1990) is a widely used parent-report measure of socially appropriate behaviors in social skills interventions for youth with social competence deficits (White et al., 2007). In the present study, it was administered only at baseline to ensure participants evidenced clinically significant deficits in social skills relative to typically developing peers.

Behavioral Assessment System for Children (BASC; Reynolds & Kamphaus, 1992) is a parent-report measure of social and behavioral adjustment in children. Only the withdrawal and social skills subscales were used, as these scales have been found to be particularly sensitive to social competence difficulties found in youth with ASD (Lindner & Rosen, 2006). The BASC subscales were used as a pre- and post-test measure.

Diagnostic analysis of nonverbal accuracy 2 (DANVA2; Nowicki, 2004) is a computer-based objective measure of receptive non-verbal cue reading through facial expression and prosodic cues. This measure was used as a pre- and post-test measure and it has demonstrated treatment sensitivity with children with ASDs (Lerner et al., 2011; Solomon, Goodlin-Jones, & Anders, 2004).

Observed social interaction

For 17 of the participants (43.6%) at pre- and post-treatment, observations were carried out for one 20-min interval by one of three trained observers (38% of treatment group and 50% of control group). Of the original sample 8 parents in the intervention group and 9 parents in the control group consented to an observation of their child in the school setting. Among these, for the intervention group there were 5 children with a primary diagnosis of ASD, 2 with a sole diagnosis of ADHD, and 1 with NLD. For the comparison group, there were 3 children with a primary diagnosis of ASD, 1 with a sole diagnosis of ADHD, and 5 children with a diagnosis of NLD.

Observations were conducted using the partial interval recording method with an audiotape consisting of 40 intervals of 20 s for each observation, separated by 10-s intervals for recording data.

The partial interval recording method, which notes whether or not a behavior occurs during specific time periods, was chosen because the type of the social behaviors being observed occurred at varying rates, and thus it was believed to provide a useful estimate of the frequency of behaviors in the natural setting. The percentage of intervals in which the following variables were observed was recorded: positive social interaction, solitary behavior or neutral behavior. These variables were created based on previous studies investigating social interactions in school aged children with ASD (Owen-Deshryver, Carr, Cale, & Blakeley-Smith, 2008). Variables were operationally defined as follows:

Positive social interaction was defined as a communicative exchange, verbal or nonverbal, between the observed child and peers during which they demonstrated one or more of the following: playing cooperatively, sharing, conversing pleasantly (as evidenced by smiling, speaking with respect, taking turns when speaking), or socially appropriate exchanges such as greetings, saying please and thank you. Any social interaction that reflected that the child is accepted by and accepts peers was coded positive.

Solitary behavior referred to a behavior performed in isolation, whether intentional or unintentional. For example, a child may isolate him or herself on the playground and wish to play alone, or play alone because no other peer wants to be with him or her. Any of these behaviors or interactions was coded as solitary.

Neutral behavior referred to behaviors that were not coded in the above categories. Examples included: behaviors instructed by an adult or demanded by the setting (bouncing a basketball to someone in gym class, or saying 'thank you' when instructed by a teacher), or interactions resulting from clumsiness (bumping into someone by accident).

To complete training on this observational coding system, the three observers coded a 30-min test tape of child interactions created by the principal investigator to establish inter-rater reliability. A two-way mixed effects intra-class correlation (ICC) of individual ratings, ICC(3,1), was used to calculate reliabilities, since the 3 raters coded all intervals, and the reliability of each individual rater was the relevant unit of analysis (Shrout & Fleiss, 1979). These ICCs are asymptotically equivalent to multi-rater kappa for categorical data over large datasets, and may in fact produce more conservative and appropriate standard errors relative to kappa (see Fleiss & Cohen, 1973; Sawa & Morikawa, 2007). Reliabilities on the test tape were excellent (ICC > .75; Cicchetti, 1994) for positive (ICC = .779), solitary (ICC = .904), and neutral (ICC = .898) behaviors.

Final behavior observations (used herein for primary analyses) took place during recess, lunch or a cooperative activity period at the child's school. Pre- and post-observations for a single child were completed by the same observer and observations were conducted

during the same activity pre- and post-treatment. No observer overlap took place during the final coding.

Parent and child interviews

Treatment participants ($n=18$) and most parents of treatment participants ($n=15$) were interviewed individually, for approximately 30 min each, with a semi-structured interview post-intervention to measure treatment satisfaction, assess the intervention's efficacy and establish social validity. Interview questions were developed by the author of this study. Interviews were audio taped and coded using grounded theory methodology qualitative procedure (Strauss & Corbin, 1998), which groups data according to similar concepts.

Procedure

Data collection

Participants and parents completed the measures as administered by an advanced doctoral student immediately prior to, and two months after, the intervention. Behavioral observations were conducted pre- and post-intervention for the treatment group and before and after an 8–12 week gap for the comparison group.

Intervention content

SCIP is a 16-session manualized intervention program developed from creative drama activities (Guli et al., 2008). The program's goal is to improve participants' social perception of non-verbal cues and to thus improve social competence in the natural setting. An earlier and shorter version of SCIP was piloted twice with positive responses from participants and parents (Glass, Guli, & Semrud-Clikeman, 2000; Guli & Semrud-Clikeman, 2002). The intervention utilized in this study is the same as was published later. Content of the manual was modified from or inspired by traditional creative drama activities (Bowell & Heap, 2001; O'Neill, 1995; Spolin, 1986), including cooperative games, story dramatization and process drama improvisations (Spolin, 1986). Activities emphasize process the interaction between participants, rather than, production or performance.

SCIP sessions initially focus on children's own experience of emotion and expand to understanding of others'. Sessions 1 through 7 target the input stage of social perception, and cover the following topics: establishing group cohesion, emotional knowledge, focusing attention, facial expression and body language, vocal cues and putting several cues together. For example, in the game "Say it With Feeling", participants say a short sentence several different times with different emotions, and take turns guessing what emotion is being conveyed. This may train them to hear the subtle differences in tone and prosody and learn how these contribute to meaning. In the game "Jell-O Room," participants move across a room pretending that the room is filled with different substances or different emotions. Thus they practice using body language to communicate feeling. Sessions 8 through 12 focus on the integration and interpretation of nonverbal cues. These sessions include activities that focus on taking others' points of view and interpreting conflicting cues. Participants engage in several improvisations, or process dramas, through which they practice perspective taking and cognitive flexibility. Leaders help participants break down complex social interactions into simpler steps, discuss the emotions present, and act out a variety of possible responses. For example, in the improvisation, "Detective Agency," children are detectives while leaders take the roles of crime witnesses. Participants interview witnesses and examine nonverbal and contextual cues to solve a mystery. Sessions 13 through 16 address the output stage of social perception, and focus on effective ways to respond to others.

Session topics include handling teasing, beginning conversations, resolving conflict and reviewing overall session content.

Session structure

Each session began with a warm-up activity (usually a cooperative game to motivate and focus attention, such as slow-motion freeze tag), followed by a review of a home challenge assignment (i.e., observing how peers begin conversations and writing in a journal about it), 2–3 main drama activities that focused on the session's topic, and discussions to process the experience. Participants were encouraged, but not required, to complete home challenges and this was rewarded with small tangible reinforcers (i.e., stickers, etc.) in the following session. Parents were given a written overview of intervention objectives, target goals and detailed schedule on the first day of the intervention. Parents were also asked to encourage their children to complete home challenges after each session.

Behavior management

A response-cost system of behavior management was used to reinforce positive behavior. Specifically, each child was entitled to choose 3 small rewards or toys at the end of each session from an assortment. After several warnings for misbehavior, a child could lose two of these rewards. Appropriate behavior was reinforced with positive verbal praise from adults, as well as with extra intermittent rewards offered to the group for participation and cooperation. Also, group leaders were trained in cooperative discipline techniques, addressing one of four outlined common underlying causes of misbehavior with specific strategies. During discussion, when a child spoke, he or she held a "talking stick" to remind children to speak one at a time. Finally, each child with the help of group leaders identified a specific goal to work on (i.e., not interrupting). When children worked toward the goal, they were praised. Similar individual goals have been identified in other intervention programs (i.e., Lerner & Levine, 2007).

Treatment fidelity

Treatment fidelity was monitored by reviewing session objectives in weekly supervision meetings. Group leaders, who were trained in six 1-h sessions prior to intervention, recorded after each session whether objectives were met. When an objective was not sufficiently met, as determined by discussion and review in weekly meetings, it was re-addressed in a following session. This level of review may be related to improved outcomes across psychosocial treatments (Herschell, Kolko, Baumann, & Davis, 2010).

Treatment conditions

The intervention was run twice. In fall 2002, eight children were placed in a younger subgroup (8–10) with four leaders (3 female, 1 male) and 7 in an older subgroup (11–14) with three female group leaders. Four children ended participation after two weeks. In spring 2003, seven boys (none of whom participated in fall 2002) aged 9–14 participated. One 13-year-old boy dropped out after 4 weeks. Some changes to treatment conditions were made in the spring. In fall, sessions were held in large university classrooms; in spring, they were in an elementary school gymnasium. To accommodate schedules, spring groups were longer, and held once a week for 12 weeks (12 longer sessions, each held for 2 h), as opposed to shorter sessions twice a week for 8 weeks in fall (16 sessions, each held for an hour and a half). Thus, both fall and spring sessions consisted of 24 h of intervention. In the spring, sessions were modified and condensed to ensure that all objectives were covered. Other variations from the manual naturally occurred as group leaders adjusted to the needs of individual group members (i.e., optional activity skipped to resolve a conflict between participants).

Data analytic plan

Baseline descriptive characteristics of completers were compared between groups using *chi-square* tests for non-continuous data (gender, number who had ADHD or ASD diagnoses, medication status) and *t*-tests for continuous data (age, IQ) and baseline scores on all recorded measures. Next, participants who dropped out were compared to completers using *t*-tests to assess potential differences in age and IQ. The Levene Test for Equality of Variance, as well as observation of relative size of standard deviations between groups, were used to determine whether *t*-tests assuming equal or unequal variances would be used and reported. Third, intent-to-treat analyses comparing change between the comparison and intervention groups were conducted on all measures of social ability. As the intervention and comparison groups were matched on observed measures at baseline, ANCOVA of change was used for all primary analyses. That is, we used two step hierarchical multiple regression models predicting endpoint values of each social ability measures. We placed corresponding baseline values of each social ability measure on Step 1. Then, we placed intervention status (dummy coded: 0 = comparison, 1 = intervention) on Step 2, such that higher values of this coefficient correspond to relative increases in the variable of interest. This procedure produces unbiased results for inferring treatment effects with the present methodological design (Van Breukelen, 2006). Power to detect large effects (see Lerner et al., 2011) was sufficient (>.84) for baseline and attrition analyses, and somewhat low (>.61) for primary analyses. For all regression analyses, Cohen's (1992) conventions for qualification of effect size were used.

Results

Descriptive analyses

There were no differences between groups in terms of gender, primary diagnosis, age or IQ between groups (see Table 1). However, the groups did differ on the number of individuals on medications, with more medicated children in the intervention group. Likewise, treatment and comparison groups did not differ on any baseline measures except the DANVA-2 Faces, on which the intervention group showed greater baseline impairment. On the SSRS at baseline, mean of both groups was more than one standard deviation below population mean, $t(28) = -9.208, p < .001$, supporting the presence of clinically significant social skills deficits in participants.

Analysis of attrition data

The Levene Test for equality of variances indicated equal variances between dropout and complete groups for IQ ($F = 1.89, p = .185$) but not age ($F = 4.49, p = .048$; see below for *SD*); thus, a *t*-test assuming equal variances was used to compare dropout and complete groups for IQ, but assuming unequal variances for age. These analyses did not reveal differences in IQ ($t = .48, p = .635$), but demonstrates significant group difference in age ($t = -2.937, p = .02$). While mean age of treatment completers in the treatment group after attrition was 125.28 months ($SD = 23.05$), mean age of those children who dropped out was 148.00 months ($SD = 9.54$).

Primary outcome analyses

Table 2 displays group means at post-test, while Table 3 summarizes the results of the primary analyses. Significant effects were not found for the BASC or DANVA2 measures. However, medium effects (Cohen, 1992) were obtained for observed increases in positive

Table 2
Posttest measures between groups.

	Clinical control group	Treatment group
DANVA2 – faces	2.46 (1.81), 13	3.37 (2.45), 18
DANVA2 – voices	5.69 (2.21), 13	6.16 (2.52), 18
BASC – withdrawal	58.79 (13.61), 14	61.89 (13.55), 18
BASC – social skills	35.07 (7.87), 14	36.22 (9.37), 18
Observed positive interactions	6.89 (7.57), 9	14.75 (9.04), 8
Observed solitary behaviors	21.11 (9.03), 9	10.13 (13.21), 8

Numbers in table are raw group means with standard deviations in parentheses followed by *n*'s. No posttest values are reported for the social skills rating system, as it was not administered at posttest. No comparison statistics are reported in this table, as between-group comparisons in change over time are addressed in Table 3.

interactions ($R^2 = .21$) and decreases in solitary play ($R^2 = .17$), indicating improved social interaction in a naturalistic setting among intervention, but not clinical control, participants.

Qualitative findings

The interview data is consistent with the observational data. When parents were asked if they observed any improvements in their child's social functioning, 75% reported one or more specific positive changes, including improvement in interpersonal relations, better understanding of nonverbal cues, increased empathy and improved self-control. Several excerpts from parent interviews regarding their child's experience are as follows: "I've noticed that

Table 3
Hierarchical multiple regression analyses for main treatment effects.

Measure	B	SE B	Beta	p	ΔR^2
BASC-withdrawal					
Step 1					.48
Pre-treatment	.62	.12	.69***	.000	
Step 2					.001
Pre-treatment	.61	.12	.69***	.000	
Clinical vs. control ^a	.67	3.70	.02	.859	
BASC-social skills					
Step 1					.52
Pre-treatment	.61	.11	.72***	.000	
Step 2					.01
Pre-treatment	.61	.11	.73***	.000	
Clinical vs. control	-1.84	2.25	-.11	.420	
DANVA-2 child faces					
Step 1					.36
Pre-treatment	.51	.12	.60***	.000	
Step 2					.001
Pre-treatment	.53	.14	.62**	.001	
Clinical vs. control	-.17	.71	-.04	.812	
DANVA 2 child voices					
Step 1					.43
Pre-treatment	.50	.10	.66***	.000	
Step 2					.01
Pre-treatment	.49	.11	.64***	.000	
Clinical vs. control	.56	.64	.12	.390	
Observed positive interactions^b					
Step 1					.30
Pre-treatment	.48	.19	.55*	.022	
Step 2					.21
Pre-treatment	.49	.16	.56*	.010	
Clinical vs. control	8.13	3.30	.46*	.028	
Observed solitary behaviors^b					
Step 1					.46
Pre-treatment	.60	.17	.68**	.003	
Step 2					.17
Pre-treatment	.57	.15	.64***	.002	
Clinical vs. control	-9.85	3.97	-.41*	.026	

^a Clinical group dummy coded to 1, control group dummy coded to 0.

^b Subset $n = 17$.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

he seems to be reaching out more to kids in the neighborhood to try to befriend them. . . I think the thing I see is that he is more interested in people, in relating to them. . .” (mother of 11-year-old boy with ASD) “. . .(I)t was like night and day. . .his face seemed a lot more animated and he seemed to make a big effort to communicate and actually do a give and take in communication. . .” (mother of 12-year-old boy with NLD). “He was looking at her, making faces to her, making her laugh, he was laughing. I noticed his face shows more expression” (mother of 8-year-old boy with ASD). “I have seen her showing more empathy toward (her sister). . .if she falls down or hurts herself and is crying I have noticed that she is showing more attention to her” (mother of 8-year-old girl with ASD). “He seems to have improved in being able to perhaps think about what the other person may be feeling, something that never entered his mind before. He even showed compassion for a friend yesterday with severe learning disabilities” (mother of an 11-year-old boy with ASD).

Similarly, 82% of children reported one or more positive effects, including the belief that they could read nonverbal cues better, make friends, learn about feelings, and get along better with others. Child participants had much to say, including the following: “I can focus on other people’s body language a little bit clearer; I can understand what they’re saying with their body language a little clearer” (11-year-old boy with ASD). “I’m a bit calmer. I can understand people now. I have a social life now” (12-year-old boy with NLD). “Now I know a lot about feelings and I can talk to my friends more easily” (10-year-old boy with ADHD). “(I learned to). . .ignore people that tease you a lot and stuff and try to find out how feelings are by seeing faces and just hearing them” (9-year-old boy with ASD). “If somebody were happy and they were showing that they were sad, I could figure out how they were doing that. . .they said they were happy and they weren’t, cause they looked sad, and I could tell they were sad” (8-year-old with NLD). “I learned that I could handle myself a lot better than I thought I could” (11-year-old boy with ASD).

Discussion

This study examined the use of creative drama to address social competence difficulties for youth with ASD, ADHD, or NLD (Kransny et al., 2003; Lerner et al., 2011). This study suggests that creative drama that addresses social perception deficits may be helpful for children with AS, ADHD, or NLD (Kransny et al., 2003; Lerner et al., 2011). This study is also among the first to suggest that treatment effects may have generalized to the natural setting, a key goal of social skills interventions. Methodologically, this study employed a population-matched comparison group, a multi-modal manualized intervention, and multiple informants to capture treatment effects. Overall, it has many indicators of quality of group evidence-based practiced research for the ASD population (Reichow, Volkmar, & Cicchetti, 2008).

Results suggested generalized improvements in positive interaction and decreased solitary play as observed in an unstructured school setting. Such generalization represents a key goal in social skills interventions (White et al., 2007). This study is also among the first to find preliminary evidence of generalization of treatment effects to the natural setting (school). Notably, medium-sized significant results were found using behavioral observation data. Changes were observed on the playground, in gym class and in the school cafeteria. This change may be especially noteworthy given the relatively small sample size used. The inclusion of behavioral observation data in ASD group intervention studies with a matched control group is rare and much needed to measure context generalization. Furthermore, since complex social skills are best captured with a multi-dimensional approach, observation data

may support findings from objective skill measures and provide the opportunity for multi-rater feedback (Koenig et al., 2009). Although hypotheses in the current study investigated intervention effect only on positive interactions and solitary behaviors, future research should also investigate the effect of intervention on the frequency of negative behaviors.

Additionally, this study replicated the widely reported finding of parent- and self-reported improvements in intervention participants (Laugeson, Frankel, Mogil, & Dillon, 2009; Lerner et al., *in press*). Analyses of attrition data suggested that those who dropped out of the intervention were slightly older than completers. This finding may be because the emerging social norms within the group tended to be more appropriate to slightly younger, pre-teenage children. Conversely, it is possible that the creative drama exercises in the SCIP curriculum are more accessible to a slightly younger age group. Quantitative results were strengthened by the qualitative reports from both parents and participants, a majority of whom observed multiple improvements in both social competence and social perception.

An important finding from this study was the difference between the results for the behavioral rating scales and computer-based measures and the observational findings and informal interviews. While the former measures did not show significant improvement, the latter did. It is possible that the behavioral ratings scales are not sensitive to subtle nuances present in the types of behaviors observed. Previous research has suggested that ratings scales may not measure the same types of behavior as direct observation or testing (Semrud-Clikeman et al., 2010). It is also possible that SCIP effected behavior change via mechanisms other than those measured by the behavior scale and computer-based measures. For example, several parents alluded to pointing changes regarding their children’s ability to take others’ point of view. This ability was not measured with BASC or DANVA2 instruments. Future research should examine such variables to creative-drama focused interventions to determine whether they do reflect observed behavior change.

Methodologically, this study has several strengths that highlight its potential for replication. First, SCIP is an innovative intervention based on creative drama that has been shown in two separate, independent studies that by directly addressing underlying deficits in nonverbal social perception improvement can be seen in social functioning. The intervention is written so that social difficulties can be addressed in the moment. This procedure allows skills to be strengthened in the presence of competing behaviors, which is necessary for social skills to generalize. Content is not scripted; instead, there is a focus on learning through process, which can be at the individual or group level.

Limitations

Several methodological limitations must be borne in mind when considering these results. First, the observational coders were not blind to the diagnosis of the participant. Thus, there is a possibility of respondent bias in the ratings. Also, while observer inter-rater reliability was obtained at a high level during the training period, additional reliabilities were not obtained during data collection. We sampled 50% of the control and 38% of the treatment group observed due to lack of personnel. This procedure may have limited our ability to make inferences about the larger sample. Although groups were matched to minimize differences, the rolling enrollment procedure may have affected outcomes (i.e., parents of treatment group may have been more eager to participate due to greater symptom severity). The finding that more children in the intervention group were prescribed medication (and exhibited greater baseline deficits in emotion recognition in faces) likely reflects a difference in severity. Indeed, it is not uncommon

for parents of children with multiple disorders to seek assistance more quickly than those with only one disorder (Gioia, Isquith, Kenworthy, & Barton, 2002). This finding represent a potential confound in these analyses, as it is difficult to rule out the possibility that differences in effect were not due to medication rather than SCIP. Future analyses should attempt to control for or match medication status between groups.

Future research that replicates this study with larger numbers of participants who have varying disorders (i.e., a sole diagnosis of ADHD, learning disabilities, etc.) would be helpful in order to determine the efficacy of the program with these populations. Future research can also build upon this study by improving measures of treatment integrity (i.e., taping and coding sessions). Additionally, it is recommended that this study be replicated with an alternative treatment group, such as a traditional social skills program to help determine the specific factors effecting change.

Conclusion

In conclusion, this study contributes to the growing body of literature suggesting that social competence difficulties may be successfully addressed in children with ASD and related disorders with a drama-based, group intervention. Unlike many treatment programs that are currently in use with ASD populations, SCIP is used in a group setting and addresses social difficulties in the moment they occur. Its structure and content are well suited for use in the school as well as clinical setting, and provide a fun means of cultivating social competence and friendships. Results of this study were promising, providing preliminary evidence that post-intervention participants improved in their ability to interact with others in the natural setting. It is hoped that future researchers replicate and expand these findings, and in doing so, continue to serve and learn from this unique population of children. Specifically, future researchers are encouraged to compare the outcome from the SCIP with similar programs, and have more data points during the intervention itself to better understand the process of change during treatment. It might also be useful to investigate additional diagnostic and demographic factors that might moderate the efficacy of the intervention (i.e., the comorbidity of mood disorders) and employ a more controlled assessment of medication status. Future examinations of SCIP and related programs will be crucial to expand these findings, and in doing so, expand the array of evidence-based approaches to helping youth with ASD and other social competence deficits to move toward social success.

References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th text revision ed.). Washington, DC: American Psychiatric Association.
- Attwood, T. (2007). *The complete guide to Asperger's syndrome*. London: Jessica Kingsley.
- Bowell, P., & Heap, B. S. (2001). *Planning process drama*. London: David Fulton.
- Chasen, L. (2011). *Social skills, emotional growth and drama therapy: Inspiring connection on the autism spectrum*. London: Jessica Kingsley.
- Cicchetti, D. V. (1994). Guidelines, criteria, and rules of thumb for evaluating normed and standardized assessment instruments in psychology. *Psychological Assessment*, 6, 284–290. <http://dx.doi.org/10.1037/1040-3590.6.4.284>
- Cohen, J. (1992). A power primer. *Psychological Bulletin*, 112, 155–159. <http://dx.doi.org/10.1037/00332909.112.1.155>
- Corbett, B., & Constantine, L. J. (2006). Autism and attention deficit hyperactivity disorder: Assessing attention and response control with the integration visual and auditory continuous performance test. *Child Neuropsychology*, 12, 335–348. <http://dx.doi.org/10.1080/09297040500350938>
- Corbett, B., Constantine, L. J., Hendren, R., Rocke, D., & Ozonoff, S. (2009). Examining executive functioning in children with autism spectrum disorder, attention deficit hyperactivity disorder and typical development. *Psychiatry Research*, 166, 210–222. <http://dx.doi.org/10.1016/j.psychres.2008.02.005>
- Davis, J. M., & Broitman, J. (2011). *Nonverbal learning disabilities in children*. New York: Springer.
- de la Cruz, R. E., Lian, M. J., & Morreau, L. E. (1998). The effects of creative drama on social and oral language skills of children with learning disabilities. *Youth Theatre Journal*, 12, 8995. <http://dx.doi.org/10.1080/08929092.1998.10012498>
- Deruelle, C., Rondan, C., Gepner, B., & Tardif, C. (2004). Spatial frequency and face processing in children with autism and Aspergers syndrome. *Journal of Autism and Developmental Disorders*, 34, 199–210. <http://dx.doi.org/10.1023/B:JADD.0000022610.09668.4c>
- Fine, J. G., Semrud-Clikeman, M., Butcher, B., & Walkowiak, J. (2008). Brief report: Attention effect on a measure of social perception. *Journal of Autism and Developmental Disorders*, 38, 1797–1802. <http://dx.doi.org/10.1007/s10803-008-0570-x>
- Fleiss, J. L., & Cohen, J. (1973). The equivalence of weighted kappa and the intraclass correlation coefficient as measures of reliability. *Educational and Psychological Measurement*, 33, 613–619. <http://dx.doi.org/10.1177/001316447303300309>
- Gioia, G. A., Isquith, P. K., Kenworthy, L., & Barton, R. M. (2002). Profiles of everyday executive function in acquired and developmental disorders. *Child Neuropsychology*, 8, 121–137. <http://dx.doi.org/10.1076/chin.8.2.121.8727>
- Glass, K. L., Guli, L. A., & Semrud-Clikeman, M. (2000). Social Competence Intervention Program: A pilot program for the development of social competence. *Journal of Psychotherapy in Private Practice*, 1, 21–33.
- Goldstein, T. R., & Winner, E. (2012). Enhancing empathy and theory of mind. *Journal of Cognition and Development*, 13, 19–37. <http://dx.doi.org/10.1080/15248372.2011.573514>
- Gresham, F. M., & Elliott, S. N. (1990). Social Skills Rating System. In Circle Pines, MN: American Guidance Service.
- Guli, L. A., & Semrud-Clikeman, M. (2002). Learning how to get along. *Attention!*, 8, 28–31.
- Guli, L. A., Wilkinson, A. D., & Semrud-Clikeman, M. (2008). *Social Competence Intervention Program (SCIP): A drama-based intervention for youth on the autism spectrum*. Champaign, IL: Research Press.
- Herschell, A. D., Kolko, D. J., Baumann, B. L., & Davis, A. C. (2010). The role of therapist training in the implementation of psychosocial treatments: A review and critique with recommendations. *Clinical Psychology Review*, 30, 448–466. <http://dx.doi.org/10.1016/j.cpr.2010.02.005>
- Johnson, D. J., & Myklebust, H. R. (1967). *Learning disabilities: Educational principles and practices*. New York: Grune & Stratton.
- Kaufman, A. S., & Kaufman, N. L. (1990). *Kaufman Brief Intelligence Test (K-BIT)*. Circle Pines, MN: American Guidance Service.
- Koenig, K., De Los Reyes, A., Cicchetti, D., Scahill, L., & Klin, A. (2009). Group intervention to promote social skills in school-age children with pervasive developmental disorders: Reconsidering efficacy. *Journal of Autism and Developmental Disorders*, 39, 1163–1172. <http://dx.doi.org/10.1007/s10803-009-0728-1>
- Kransny, L., Williams, B. J., Provencal, S., & Ozonoff, S. U. (2003). Social skills interventions for the autism spectrum: Essential ingredients and a model curriculum. *Child & Adolescent Psychiatric Clinics of North America*, 12, 107–122. [http://dx.doi.org/10.1016/S1056-4993\(02\)00051-2](http://dx.doi.org/10.1016/S1056-4993(02)00051-2)
- Laugeson, E. A., Frankel, F., Mogil, C., & Dillon, A. R. (2009). Parent-assisted social skills training to improve friendships in teens with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 39, 596–606. <http://dx.doi.org/10.1007/s10803-008-0664-5>
- Lerner, M. D., Hileman, C. M., & Britton, N. Autism spectrum disorder in adolescents: Promoting social and emotional development. In T. Gullotta & C. Leukefeld (Eds.), *Encyclopedia of primary prevention and health promotion: Adolescence* (2nd ed., Vol. 3). New York: Springer, in press.
- Lerner, M. D., & Levine, K. (2007). Spotlight method: An integrative approach to teaching social pragmatics using dramatic principles. *Journal of Developmental Processes*, 2(2), 91–102.
- Lerner, M. D., Mikami, A. Y., & Levine, K. (2011). Socio-dramatic affective-relational intervention for adolescents with Asperger syndrome & high functioning autism: Pilot study. *Autism*, 15, 21–42. <http://dx.doi.org/10.1177/1362361309353613>
- Lerner, M. D., & Mikami, A. Y. (2012). A preliminary randomized controlled trial of two social skills interventions for youth with High Functioning Autism Spectrum Disorders. *Focus on Autism and Other Developmental Disabilities*, 27, 145–155. <http://dx.doi.org/10.1177/1088357612450613>
- Lindner, J. L., & Rosen, L. A. (2006). Decoding of emotion through facial expression, prosody, and verbal content in children and adolescents with Asperger's Syndrome. *Journal of Autism and Developmental Disorders*, 36, 769–777. <http://dx.doi.org/10.1007/s10803-006-0105-2>
- Little, L., & Clark, R. R. (2006). Wonders and worries of parenting a child with Asperger syndrome & nonverbal learning disorder. *American Journal of Maternal Child Nursing*, 31, 39–44.
- Lipton, M., & Nowicki, S. (2009). The social emotional learning framework (SELF): A guide for understanding brain-based social emotional learning impairments. *Journal of Developmental Processes*, 4, 99–115.
- Matson, J., Matson, M., & Rivit, T. (2007). Social skills treatments for children with autism spectrum disorders: An overview. *Behavior Modification*, 31(5), 682–707. <http://dx.doi.org/10.1177/0145445507301650>
- McCloskey, M. S., Noblett, K. L., Deffenbacher, J. L., Gollan, J. K., & Caccaro, E. F. (2008). Cognitive-behavioral therapy for intermittent explosive disorder: A pilot randomized clinical trial. *Journal of Consulting and Clinical Psychology*, 76, 876–885. <http://dx.doi.org/10.1037/0022-006X.76.5.876>
- Minne, E. P., & Semrud-Clikeman, M. A social competence intervention for young children with high functioning autism and Asperger syndrome: A pilot study. *Autism*, in press
- Nowicki, S. (2004). *Manual for the receptive tests of the diagnostic analysis of nonverbal accuracy 2*. Atlanta: Emory University.

- O'Neill, C. (1995). *Drama worlds: A framework for process drama*. Portsmouth, NH: Heinemann.
- Owen-Deshryver, J., Carr, E., Cale, S., & Blakeley-Smith, A. (2008). Promoting social interactions between students with autism spectrum disorders and their peers in inclusive school settings. *Focus on Autism and Other Developmental Disabilities*, 23(1), 15–28. <http://dx.doi.org/10.1177/1088357608314370>
- Reichow, B., Volkmar, F. R., & Cicchetti, D. V. (2008). Development of the evaluative method for evaluating and determining evidence-based practices in autism. *Journal of Autism and Developmental Disorders*, 38, 1311–1319. <http://dx.doi.org/10.1007/s10803-007-0517-7>
- Reynolds, C. R., & Kamphaus, R. M. (1992). *Behavior Assessment System for Children, Structured Developmental History (BASC-SDH)*. Circle Pines, MN: AGS.
- Rourke, B. P. (1995). *Syndrome of nonverbal learning disabilities: Neurodevelopmental manifestations*. New York: Guilford.
- Sawa, J., & Morikawa, T. (2007). Interrater reliability for multiple raters in clinical trials of ordinal scale. *Drug Information Journal*, 41, 595–605.
- Schneider, C. (2007). *Acting antics: A theatrical approach to teaching social understanding to kids and teens with Asperger syndrome*. London: Jessica Kingsley Publishing.
- Semrud-Clikeman, M., Walkowiak, J., Wilkinson, A., & Minne, E. P. (2010). Direct and indirect measures of social perception, behavior, and emotional functioning in children with Aspergers disorder, nonverbal learning disability, or ADHD. *Journal of Abnormal Child Psychology*, 38, 509–519. <http://dx.doi.org/10.1007/s10802-009-9380-7>
- Sherratt, D., & Peter, M. (2002). *Developing play and drama in children with autistic spectrum disorders*. London, England: David Fulton Publishers.
- Shrout, P. E., & Fleiss, J. L. (1979). Intraclass correlations: Uses in assessing rater reliability. *Psychological Bulletin*, 86, 420–428.
- Solomon, M., Goodlin-Jones, B. L., & Anders, T. F. (2004). A social adjustment enhancement intervention for high functioning autism, Asperger's syndrome, and pervasive developmental disorder NOS. *Journal of Autism and Developmental Disorders*, 34(6), 649–668. <http://dx.doi.org/10.1007/s10803-004-5286-y>
- Spolin, V. (1986). *Theater games for the classroom*. Evanston, IL: NU Press.
- Strauss, A., & Corbin, J. (1998). Basics of qualitative research. In *Grounded theory procedures and techniques* (2nd ed.). Newbury Park, CA: Sage.
- Van Breukelen, G. J. P. (2006). ANCOVA versus change from baseline had more power in randomized studies and more bias in nonrandomized studies. *Journal of Clinical Epidemiology*, 59, 920–925. <http://dx.doi.org/10.1016/j.jclinepi.2006.02.007>
- Warger, C. L. (1984). Creative drama for autistic adolescents: Expanding leisure and recreation options. *Journal of Child and Adolescent Psychotherapy*, 1, 15–19.
- Wechsler, D. (1991). *WISC-III manual*. San Antonio, TX: Psychological Corporation.
- Woodbury-Smith, M. R., & Volkmar, F. (2009). Asperger syndrome. *European Child and Adolescent Psychiatry*, 18, 2–11. <http://dx.doi.org/10.1007/s00787-008-0701-0>