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# Is It Enough? Challenges Generalizing Social Skills Gains into Community Settings

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Educational Specialist


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ABSTRACT

Is It Enough? Challenges Generalizing Social Skills Gains into Community Settings

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Group social skills training (GSST) is an important intervention approach to help children and adolescents with autism spectrum disorder (ASD) to find more success in social engagement and inclusion.  However, there is a lack of research using direct behavioral observations, especially in generalization of acquired skills to settings other than the treatment setting.  We provided social skills training to 25 adolescents with ASD using a curriculum shown to have positive effects (the UCLA PEERS® curriculum).  We also administered the Autism Social Skills Profile (ASSP) and Social Communication Questionnaire – Current (SCQ-Current) to the parents of participants before and after the GSST to ensure it had the intended effect, which showed minor improvements in some areas of social engagement, though not statistically significant.  We then provided seven participants and their peers in their community groups with a brief intervention that taught principles of including those with disabilities.  We analyzed each of these seven participants' level of social engagement in their community groups before and after the intervention using a multiple baseline design.  Peer inclusion instruction produced mixed results across participants.  We discuss the feasibility and future directions for the generalization of acquired social skills.

ACKNOWLEDGMENTS

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CHAPTER 1

**Introduction**

Autism spectrum disorder (ASD) is a neurodevelopmental disorder characterized by social, emotional, and behavioral deficits (American Psychiatric Association [APA], 2013). Common features of ASD include social communication problems, restrictive and repetitive interests and behaviors, and difficulty relating to others (APA, 2013). The reported prevalence of ASD has more than doubled in the past 12 years (Baio et al., 2018; Rice, 2007) and it is reported that the current estimates of prevalence are approaching 1% in multiple countries (Brugha et al., 2011). Most individuals who are diagnosed with ASD are diagnosed as children before entering grade school (60.9% at or before age four), with the median age of diagnosis being 56 months (Baio et al., 2018), but ASD has been shown to be persistent over the life course (APA, 2013). There is a higher prevalence among males than females diagnosed with ASD, with a ratio of about 4:1 (Baio et al., 2018).

**Social Deficits of Autism Spectrum Disorder**

One of the hallmark deficits of ASD is in the social communication domain; specifically, those with ASD are described as having "persistent deficits in social communication and social interaction across multiple contexts" (APA, 2013, p. 31). Examples of such deficits are difficulties in social-emotional reciprocity; difficulty in understanding and using nonverbal communicative behaviors; and difficulties in developing, maintaining, and understanding relationships. These examples illustrate that those with ASD can have significant difficulties forming and maintaining positive peer relations and friendships.

Many attribute social deficits to a lack of interest on the part of the individual with ASD (Adamson, Deckner, & Bakeman, 2010), but this is not true of all individuals with ASD.

Bauminger and Kasari (2000) have shown that children and adolescents with ASD did express a desire to engage in social interactions with their peers, and Lasgaard, Nielsen, Eriksen, and Goossens (2010) showed that adolescent boys with ASD attending special education schools generally feel lonelier than adolescent boys in a control group from regular schools. Additionally, Mendelson, Gates, and Lerner (2016) found that

> Boys with ASD consistently profess wanting friendship, report having friends, and are reported by their parents and peers to have at least some friends, — even if they are fewer in number and lesser in quality than those of [typically-developing peers]. (p. 609)

This implies that individuals with ASD do not lack an interest in human interaction and friendships, but they may simply lack the skills or the conceptual knowledge of how to make and maintain quality friendships. These findings also indicate there is some suffering due to social skill deficits.

**Adolescents with Autism Spectrum Disorder**

Most social skills research on those with ASD has focused on children (Laugeson, Frankel, Gantman, Dillon, & Mogil, 2012; Weiss & Harris, 2001), leaving much research to be done concerning how ASD develops with age. The social deficits associated with ASD become more prominent in adolescence, in part because of the increased complexity of social communication at that age (Williams White, Keonig, & Scahill, 2007). Recent initiatives to include individuals with ASD with typical peers in school settings necessitate more evidence-based social skills treatments so that students with ASD can thrive in such environments (Williams, Johnson, & Sukhodolsky, 2005; Williams White et al., 2007).

The need for social skills interventions is apparent in the observation of immediate and long-term outcomes of those who experience the social skills deficits common to those with

ASD.  Such individuals have been found to experience less social support, more loneliness, and

an increased risk of peer rejection and social isolation (Bauminger & Kasari, 2000; Chamberlain,

Kasari, & Rotheram-Fuller, 2007; Lasgaard et al., 2010); additionally, such deficits have been

found to presage mood and anxiety problems later in development (Williams White et al., 2007).

These deficits impact more than just the socio-emotional wellbeing of these individuals, as they

often experience academic and occupational underachievement, and adults with ASD are much

more likely than the general population to be unemployed or underemployed (Machalicek et al.,

2008; Williams White et al., 2007).  This hallmark deficit in social functioning is consequently a

deficit that merits attention and intervention, and intervention prior to adulthood is essential to

improve outcomes and quality of life.

**Social Skills Training**

One common intervention to mitigate social skills deficits is group social skills training

(GSST).  The purpose of such training is to increase the quality of social interaction for

individuals with ASD, giving them skills they need to build and foster relationships with others

(Cappadocia & Weiss, 2011; Williams White et al., 2007).  The improvement of social skills can

benefit the individual in multiple other ways, as Rogers (2000) has noted increased social

interaction leading to improved skills in novel language and decreased inappropriate behavior.

Social skills training has also been shown to be effective for individuals struggling with social

phobia or specific learning disabilities (Cappadocia & Weiss, 2011).  However, Rao, Beidel, and

Murray (2008) have noted that while there is much support for the improvement of social skills

in a classroom setting when training is given in such a setting, there has been less research and

support surrounding the externalization of acquired skills and improvements.

Thus, while it is generally accepted that social skills training is beneficial, there is some debate as to its generalizability. Overall, there is a paucity of research findings regarding the generalizability of social skills interventions. In their comprehensive review of social skills interventions spanning from 1997 to 2008, Wang and Spillane (2009) found that only one in four social skills studies reported generalization findings; additionally, none of those that reported generalization findings in their review were GSST interventions.

Where the generalization of GSST has been investigated, it has been found to be questionable at best. Williams White et al. (2007) noted that such improvements may be confined to only those skills that are directly and explicitly taught, and may not generalize to other environments such as home or school. GSST interventions have also been criticized as not being intense enough in the amount of time spent providing training (Gresham, Sugai, & Horner, 2001). Gates, Kang, and Lerner (2017) observed that self-report measures for social skills trainings often indicate large effects in domains of social knowledge but not social competence, which would indicate that participants may not feel comfortable or competent in applying the skills they have learned in real-life situations outside of the training environment. This could be due to the lack of literature using behavioral observations as an outcome measure, as most studies in GSST use a pre-/post-survey research design (Cappadocia & Weiss, 2011). In a large meta-analysis of school-based social skills interventions for individuals with ASD, Bellini, Peters, Benner, and Hopf (2007) reported low or questionable effectiveness of social skills interventions as it pertains to the generalization of social skills. This has been noted as an important factor of maintenance that needs to be considered in the development of social skills training interventions (Rao et al., 2008). Due to these potential limitations of GSST, there is a need to look at the contextual factors that surround adolescents with ASD in settings external to

those in which they receive GSST, especially in light of research that has also shown that the negative biases of their peers persist even after these adolescents with ASD have acquired greater social skills (Mikami, Lerner, & Lun, 2010).

**Community Groups**

As there is a lack in research of direct behavioral observations in environments secondary to the treatment environment, activity-based community groups provide a great opportunity for investigation in such a location to occur. Bonhert, Lieb, and Arola (2016) have found there to be many benefits for adolescents with ASD who participate in what they refer to as organized activities. Their definition of such activities comes from the work of Mahoney, Lord, and Carryl (2005), and refers to voluntary activities that have regularly scheduled meetings, have expectations and rules for participants, involve several participants, are supervised and guided by adults, and have as a central focus skill development or goal achievement. In their review of such organized activities, Bonhert et al. (2016) found that organized activities are effective in providing adolescents with ASD with a broadening of their social network, yet they were not sufficient to provide an increase in friendship quality that these teens sought. Teens participating in these community groups who have just received evidence-based GSST may be better able to maximize friendship quality with those in these groups.

**Peer Inclusion and Disability Awareness**

Inclusion refers to an integration of a part into the whole (Sheppard, 2000). With federal legislation and organizational initiatives advocating for inclusion of individuals with disabilities in educational settings (Individuals with Disabilities Education Act, 2004; United Nations Educational, Scientific and Cultural Organization, 2017), there has been a ongoing trend to have those with disabilities such as ASD placed in the least restrictive environment in schools and to

be included in a general education setting whenever appropriate. However, simply placing a student with disabilities in an environment with typically-developing peers does not provide students with the opportunities for social interaction and inclusion that they need (Lindsay & Edwards, 2013). Chung, Carter, and Sisco (2012) have found that there is very little interaction between students with disabilities and the general education population when there are not well-planned supports for these students in place. Brock and Carter (2016) have shown that there are evidence-based practices that increase the inclusion of individuals with ASD in schools. These effective interventions often actively involve the peers of students with disabilities to promote both their social skill acquisition and more active participation in various activities (Carter et al., 2017). Odom and Strain (1984) identified two key ingredients for the effective inclusion of children with disabilities. The first involves the rehearsal of inclusion interventions where persistence is taught when the recipient of the invitation to play does not respond initially. The second key ingredient is that specific activities should be planned with the needs and interests of children with disabilities in mind.

There have been mixed outcomes from programs focusing on increasing the disability awareness of children and adolescents, with some finding a positive change in attitudes towards people with disabilities following an intervention, and others reporting no change (Lindsay & Edwards, 2013). Childhood and adolescence are important times to provide such an intervention because of the level of influence that knowledge has upon attitudes at this age (Ali, Fazil, Bywaters, Wallace, & Singh, 2001; Pitre, Stewart, Adams, Bedard, & Landry, 2007). A lack of knowledge can perpetuate stigmas and practices that foster social exclusion for adolescents with ASD (Lindsay & McPherson, 2012). In their systematic review of disability awareness interventions, Lindsay and Edwards (2013) found that these interventions were presented in a

variety of formats, and common elements of successful interventions included breaking down stereotypes and creating awareness of the barriers that people with disabilities encounter. They also found that those in older grades were more accepting than those in younger grades. Their review pointed out two areas of weakness in the existing literature regarding these interventions: first, very little is known about how they impact the children with disabilities, as most have focused on the impact of the intervention on their peers rather than their perceptions of how peers are treating them or how these interventions make them feel; second, very few of these interventions were developed or implemented by clinicians who had a knowledge of pediatric disability. It is evident that there is a need for disabilities awareness interventions implemented by clinicians who have such a knowledge and that adolescents may be an effective target group to receive such an intervention.

The legislation and initiatives that have led to educational mainstreaming have also led to the perception that caring for those with disabilities is primarily the domain of the school systems. However, individuals with disabilities such as ASD may benefit most from a multi-faceted approach to intervention and inclusion. While there have been studies examining outreach programs in educational settings (Sheppard, 2000), there has been minimal research investigating how individuals with ASD or other disabilities are supported in community settings with typically-developing peers. Moving from classroom settings to community settings is an obvious next step in assisting those with ASD.

**Statement of the Problem**

While GSST has become a popular intervention for children and adolescents with ASD, there are very few studies examining how individuals who receive GSST are using the acquired skills in settings external to the treatment setting. Further, there is limited research using direct

behavioral observations of learned social skills or peer inclusion interventions in settings that are not either the treatment setting or in a school-based setting. Further research is needed in evaluating some of the contextual factors that impact an adolescent's ability to use their acquired social skills in settings outside of the initial treatment setting. Without further research to find answers to these problems, GSST interventions will continue to be developed for and provided to children and adolescents with ASD without regard for whether or not they will be successful in developing meaningful, lasting friendships once they leave the program.

## Statement of Purpose

The purpose of this study is to examine the effect of a brief peer inclusion intervention in a community setting on the level of social engagement of high-functioning adolescents with ASD who have previously received an evidence-based GSST.

## Research Questions

This study will address the following research questions:

1. Does GSST for adolescents with ASD result in gains in learned social skills as measured by parent perceptions?

2. Are there any observable increases in social interaction levels for adolescents with ASD that have received GSST when observed in their community groups following a brief intervention teaching peer inclusion strategies to that community group?

CHAPTER 2

**Method**

In this section, the methods used in the study will be discussed. First, study approval will be described for the various groups involved in the study. Then participant characteristics will be described, followed by a description of the settings in which the study took place. Afterwards, procedures and measures used in the study will be explained, and the section will conclude with a description of social validity and data analysis methods.

**Study Approval**

The study was approved by the university Institutional Review Board. All parents gave informed written consent (see Appendix A) and children/adolescents were given one of two different written assent forms depending on their age (see Appendices B and C). Parent consent and child/adolescent assent was obtained for any groups in which video recordings were made (see Appendices D, E, and F); data was collected about an individual via live coding with permission of community group leaders and parents of the participant if any community groups declined participation in the recording of video in their group.

**Participants**

There were originally 25 participants included in the GSST across three groups, consisting of 19 males, ages 12 to 17 ($M = 13.37, SD = 1.38$) and six females, ages 12 to 16 ($M = 13.50, SD = 1.76$). All participants were of higher cognitive functioning as measured by full scale IQ score. 84% (21) of participants were White non-Hispanic, 8% (2) were White Hispanic, 4% (1) were Native American, and 4% (1) were mixed race Hispanic (White and Asian). Regarding highest level of education completed, 24% (6) of participants had one parent with a college (associate or bachelor's) degree and another with a graduate degree; 16% (4) had one parent with

a college degree and another with some college; 12% (3) had two parents with graduate degrees; 12% (3) had two parents with some college; 8% (2) had one parent with some college and no information from the other parent; 8% (2) had two parents with college degrees; 8% (2) had one parent with some college and another with a high school degree; 4% (1) had one parent with a high school degree and another with some high school; 4% (1) had one parent with a graduate degree and no information from the other parent; 4% (1) had one parent with a college degree and no information from the other parent; 4% had no information reported from either parent. Additional individual demographic characteristics for these 25 participants are listed in Appendix G (note that pseudonyms are used to protect participant confidentiality). Participants were recruited through various networks within the local autism community: emails were sent to school districts and ASD advocacy listservs, and announcements were made at local workshops seeking participants. All who expressed an interest were recruited for the study; in essence, this is a form of self-selection sampling, and as such, it should be regarded as a form of bias and a limitation indicating that the sample may not be wholly representative of the population of adolescents with ASD. All participants had a preexisting medical diagnosis of ASD, except one participant whose diagnostic evaluation for significant social skills difficulties was pending at the time; this participant was later diagnosed with social pragmatic communication disorder. This student was not included in the single-subject data analysis that will be described below. Participants were no more than two years behind academically by parent report, had age-appropriate language skills, and no significant classroom behavior problems. Social skills groups also included some typical peers who were siblings of participants; this group of typical peers was comprised of a 15-year-old male and four females ranging in age from 12 to 20. These peers were not screened for ASD or social skills difficulties.

**Settings**

      **GSST setting.** All participants and typical peers met weekly for social skills instruction in a classroom-style setting in a private university. Their parents also met simultaneously in the same location in a different room to receive instruction on the content of the adolescent lesson.

      **Community group settings.** The primary intervention and measurement setting was the community group setting of a participant. These groups were chosen by the adolescent participants in collaboration with their parents and the requirements were that the participants had to already be a member of the group and that the group met frequently (e.g., weekly) on a year-round basis. These groups varied in their locations in the geographic area surrounding the university and were all groups that the participants had been involved with for some time prior to the study. Most groups chosen were faith-based community groups for adolescents, and those for male participants were frequently tied to the Boy Scouts of America. Behavioral observations in these groups were conducted in a variety of places, including gymnasiums, large classroom-like settings, or foyers and hallways.

**Procedures**

      **ASD symptom verification.** Autism symptoms were verified by the administration of the Autism Diagnostic Observation Schedule, Second Edition (ADOS-2; Lord et al., 2012) by a research-reliable clinician who was also the faculty advisor overseeing the study and one of the co-authors of this study. In addition to the ADOS-2, ASD symptoms were further characterized by scores on the Social Communications Questionnaire (SCQ-Current and SCQ-Lifetime; Rutter et al., 2003). Estimates of cognitive function were obtained using the Wechsler Intelligence Scale for Children--Fourth Edition (WISC-IV; Wechsler, 2003), the Wechsler Intelligence Scale for Children--Fifth Edition (WISC-V; Wechsler, 2014), the Wechsler Adult Intelligence Scale--

Fourth Edition (WAIS-IV; Wechsler, 2008), and the Stanford-Binet Intelligence Scales, Fifth

Edition (SB-5; Roid, 2003). The WISC-V was administered wherever possible and appropriate,

but the WAIS-IV was administered for two individuals due to age and standardized norms. The

WISC-IV was administered to one individual by an off-site examiner from whom the records

were obtained with permission; these records were deemed current by the authors. The SB-5

was also administered to two participants so as to not interfere with school-based testing for

these participants.

       **PEERS® intervention.** Three separate groups of participants met weekly for social

skills instruction following The Program for the Education and Enrichment of Relational Skills

(*PEERS®*) Treatment Manual (Laugeson & Frankel, 2010) outline for intervention. *PEERS®* is

a social skills training curriculum specifically designed for high-functioning adolescents with

ASD, and is one of the more consistently used and researched manualized social skills training

programs for adolescents (Karst et al., 2015; Laugeson, Ellingson, Sanderson, Tucci, & Bates,

2014; Laugeson et al., 2012; Mandelberg et al., 2014). Some of the conceptual benefits of this

intervention are that it is specifically aimed at increasing the friendships of adolescents; it

involves the parents, both as sources of support and in generalization of skills learned; and it is

manualized and therefore replicable. Long-term follow-up assessments by Mandelberg et al.

(2014) showed PEERS® to result in higher social functioning as well as in frequency of peer

interactions and social skills knowledge maintained one to five years later. It has also been

speculated that parent involvement in the treatment model resulted in additional improvements in

social functioning between intervention and the time of follow-up. This long-term maintenance

indicates that participants are using the skills learned in environments external to the treatment

environment. However, Bellini et al. (2007) indicate that skill maintenance is not necessarily

equivalent to skill generalizability, and often there are higher rates of maintenance than there are of generalizability.  Additionally, direct behavioral observation of gains in an environment secondary to the treatment environment has yet to be investigated.

The curriculum is broken down into 14 sessions, which in our study were administered over an average of 14 weeks, with formal sessions lasting approximately 60 minutes.  The curriculum includes a variety of topics pertaining to skills necessary to the formation and maintenance of friendships, such as trading information, choosing appropriate friends, and entering or exiting a conversation (see Table 1 for a listing of the content of each of the 14 sessions).  The three groups receiving the GSST ranged in size from eight to 13 individuals ($M =$ 11$, SD =$ 2.65).  Instruction was given by undergraduate and graduate students in psychology and other related disciplines. These students were directly supervised by a faculty advisor who is also a licensed psychologist.  One of the graduate students involved in the initial implementation of the intervention had received formal training on the administration of the *PEERS*® curriculum.  To ensure fidelity, training was given to all instructors prior to treatment group involvement, which included observation of treatment sessions, direct instruction on instructional methods, and mock instruction using the *PEERS*® curriculum, all overseen and guided by the faculty advisor.  Additionally, a fidelity checklist was completed regularly after sessions (see Appendix H) by the instructors of both the participant and parent groups.  Data were also gathered regarding participant attendance in GSST using that same fidelity checklist, and a minimum of 75% attendance was determined to be sufficient for inclusion of a participant's data in single-subject analysis.

Table 1

*PEERS® Sessions and Content*

| Session | Content |
| --- | --- |
| 1 | Introduction and conversational skills I: Trading information |
| 2 | Conversational skills II: Two-way conversations |
| 3 | Conversational skills III: Electronic communication |
| 4 | Choosing appropriate friends |
| 5 | Appropriate use of humor |
| 6 | Peer entry I: Entering a conversation |
| 7 | Peer entry II: Exiting a conversation |
| 8 | Get-togethers |
| 9 | Good sportsmanship |
| 10 | Rejection I: Teasing and embarrassing feedback |
| 11 | Rejection II: Bullying and bad reputations |
| 12 | Handling disagreements |
| 13 | Rumors and gossip |
| 14 | Graduation and termination |

Social skills instruction sessions followed a format of homework review, followed by direct instruction on the topic of that week. After direct instruction, the group was broken into smaller groups and teens either shared information about personal items they had brought or participated in indoor or outdoor games, all while practicing the skills covered in that week's lesson. Parents then entered the room for a re-unification session and review of the homework to be completed that week. One addition to the *PEERS®* curriculum was a modification to the incentive token economy system for participation. The modification was to make the token economy system include immediate (same-day) back-up reinforcers rather than working toward a graduation party. The rationale for this modification was two-fold: (a) the data acquired from

the token economy as modified can be used for further analysis in other studies, and (b) the immediate back-up reinforcement was deemed more effective in promoting consistent attendance, as many parents in other settings may simply be incentivized by the financial investment put into such an intervention, where our program was offered free of charge. Such reward systems have been shown to be influential in other informal educational settings (Price, Vining, & Saunders, 2009). Teens were awarded points throughout each session based on their participation and completion of homework, and at the end of each session could redeem these points for various prizes. Prize offerings were determined by informal preference assessment inquiries and included items such as toy figurines, trading cards, books, art supplies, candy and other miscellaneous items. The process of selecting prizes was optional for participants and they could spend up to 30 additional minutes beyond class instruction shopping for prizes.

Parents met in a separate room to receive instruction on the same topics as their teens in addition to having an opportunity to give feedback regarding homework assignments and progress made by participants. Instruction to parents was also given by this same pool of undergraduate and graduate student instructors under the same level of direct supervision. Undergraduate and graduate instructors instituted a rotation between the different roles of instructors and assistants. Assistants would provide help in many ways depending on the need of the instructor and the group that week, such as taking clinical notes to be sent to parents on a weekly basis, monitoring prize distribution and tracking point accumulation.

**Community group intervention.** During the intervention, participants and their peers in their community group received 120-180 minutes of instruction and activities focused on inclusion of individuals with visible and non-visible disabilities. The curriculum for instruction was based on the Disabilities Awareness merit badge requirements (Boy Scouts of America

[BSA], 2014; see Table 2 for a brief outline of this curriculum), and permission was received from the local BSA council to instruct groups and pass them off on the merit badge requirements. The faculty advisor was a registered merit badge counselor.

There were two additions to the BSA merit badge curriculum. The first was a role-play exercise where volunteers from the community group practiced interacting with the presenter who was acting as an individual with either a visible or non-visible disability. The goal of this exercise is to have group members demonstrate persistence in inviting and encouraging the individual with the disability to participate in an activity. The second addition was giving the group time to brainstorm ways in which they could include those with disabilities in some of their upcoming group activities. Both additions were based on research by Odom and Strain (1984) mentioned above, identifying effective methods mentioned above for peer inclusion of those with disabilities.

Participants were not identified as having autism or any other disability to the community group or adult leaders, and although ASD was included as one of the disabilities in the instruction, it was not the primary focus of the instruction (to maintain confidentiality of our participants, some of whom had not disclosed their ASD diagnosis to their community group). The association of the researchers with the participants was also kept confidential in the community setting unless the participant decided to disclose such. Community group size ranged from small groups (six to 12 individuals) to large groups (25 to 35 individuals). Adult leaders were always present in the groups during instruction. In some cases, permission was not granted by community group leaders to gather data or provide the merit badge instruction: eight groups denied video recording specifically, five community group leaders did not consent to any form of data collection, three group leaders refused any participation, three group leaders never

responded, and one group allowed data collection but did not want the merit badge instruction because it was a girls-only group. Other reasons community group data were not collected include: one participant's parents never provided contact information for their community group, one participant consistently arrived after the start of the community group meeting (all coding ceased with the start of the meeting), and one case where there were multiple group leaders involved and not all leaders consented. In this latter case, at a later date, the community group leaders requested that the researchers meet with them and talk about autism and understanding more about some of the associated difficulties and needs. Despite various rates of participation in community group data collection, no participants were excluded from GSST based on their community group's participation status.

**Measures**

**The Autism Social Skills Profile (ASSP).** Standardized measures were administered to describe participant symptoms as well as to note any changes in symptoms as a result of GSST to potentially increase the support for the PEERS® curriculum in the literature. The ASSP (Bellini, 2006) is an assessment of social functioning that has been used to measure intervention progress. It yields a total score as well as three subscales (social reciprocity, social participation/avoidance, and detrimental behaviors), with higher scores indicating greater social functioning. The ASSP was administered prior to and following PEERS® instruction as a pre-/post-intervention measure of subjective parent-reported changes in social skill deficits. The ASSP has been found to be a reliable and valid instrument for measuring the social skills functioning in children and adolescents with ASD, being internally consistent ($\alpha = .926$ for total sample) and having a satisfactory level of test-retest reliability (.904 for total sample), with the measure also being submitted to the review of numerous organizations to assess face validity (Bellini & Hopf, 2007).

Table 2

*Disabilities Awareness Merit Badge Curriculum*

| Topic | Associated Activities |
| --- | --- |
| People First | Discuss person-first language and disability etiquette. |
| Agencies | Participants are to visit an agency that serves individuals with disabilities (to be completed outside of instruction for completion of merit badge). |
| Activities and Adaptations | Watch a video displaying adaptive sports and discuss different assistive technologies for individuals with disabilities. Participants discuss how they can adapt their community group activities to include those with disabilities (additional non-manualized role-play and brainstorming activities included here). |
| Accessibility | Participants identify how accessible their community group meeting location is for individuals with disabilities (must also be done in another location to complete merit badge). |
| Advocacy, Attitudes, and Awareness | Discuss myths and misconceptions concerning individuals with disabilities, and discuss how attitudes have changed as a result of working on the merit badge. Participants also make a commitment describing what they will do to show a positive attitude about people with disabilities and encourage such in others. |
| Career Opportunities | Discuss different careers involving work with individuals with disabilities. |

**The Social Communication Questionnaire—Current Version (SCQ-Current).** SCQ-Current data were also collected as a pre-/post-intervention measure of changes in communication skills and social functioning following PEERS® instruction. The content of the SCQ-Current has been based on the valid and reputable Autism Diagnostic Interview—Revised (ADI-R; Lord, Rutter, & Le Couteur, 1994) and has been demonstrated to be internally consistent ($\alpha = .90$), to be highly sensitive, and to have a satisfactory level of test-retest reliability (0.74, though admittedly on a small sample); however, there is some debate as to its specificity (Corsello et al., 2007; Fernandopulle, 2011). Its use as a measure of change is more

intended to assess current abilities over time. Despite this debate, the authors of this study determined the measure to be sufficient for the purposes of measuring possible changes in social communication symptomatology before and after GSST.

**Behavioral coding.** While there is a clear emphasis in the literature on the use of post-test scores to obtain mean difference scores, it is questionable as to whether such a method is appropriate for capturing constructs as complex as social skills and social engagement (Gates et al., 2017). In this study, however, a direct behavioral observation measure was implemented in this study to allow the researchers to measure this construct and observe a pattern of change as opposed to simply viewing a single endpoint to determine change. Participant social engagement behaviors were coded for frequency and quality of social interaction with others in their community group settings, as described below. Social engagement was measured for an average length of about eight weeks in their community settings. A minimum of three weeks of observations both before and after the merit badge instruction were required for a participant's behavioral observation data to be included in data analysis. Behavior was coded only during unstructured time prior to formal community group activity. Whenever possible, behavior was video recorded to allow for reliability to be established across multiple coders. Recorded videos were later coded by reliable undergraduate coders (procedures for establishing reliability are described below). For community settings without video permission, live coding was performed by reliable undergraduate coders.

In most cases, reliable undergraduate coders used pen and a paper copy of the behavioral coding sheet (see Appendix I) to code social engagement either while watching recorded video observations or performing live coding, though occasionally a digital copy of the coding sheet was used. Where video recording was not permitted but data collection was still allowed, data

were gathered using a live coding method, in which the same coding system was used, but coders recorded using pen and paper methods at ten second intervals while directly observing live behavior.

A partial-interval coding method was implemented, where the highest quality of social engagement observed in a ten-second interval was recorded. A hierarchy was imposed to decide which behaviors to code if multiple behaviors were observed within each interval. The highest quality of engagement in the hierarchy was defined as *reciprocal* social interaction with a peer or an adult. Coding measured three facets of social engagement: whether the participant was engaged with another person or not; if engaged, whether or not the engagement was one-sided or reciprocal (back-and-forth interchange); and if engaged, with whom social engagement took place (a peer or an adult). To measure whether a participant was engaged or not, one of three codes were specified to indicate whether the participant was solitary (S), solitary while watching others interact (SW), or engaged with another (E). If a participant was found to be socially engaged at any time during a ten-second interval, their behavior was coded as engaged, and two additional codes were applied to measure how that engagement was presented, either through responding to (R) or initiating (I) social contact. These two codes were not mutually exclusive and both were recorded if both behaviors were found in socially engaged participants within a ten-second interval (the use of both defining the highest level of engagement, a reciprocal social interaction). For example, if interaction was primarily initiation (one-sided talk), but there were some instances of reciprocal interaction, the higher level of social interaction (in this case a mixture of both initiating and responding, or IR codes) was used as the code for the interval. Lastly, two additional measures were used with socially engaged participants to indicate with whom they were engaged, either a child or adolescent peer (C) or an adult (A). These two

measures could also be used simultaneously in a ten-second interval where a participant was engaged with both an adult and a child or adolescent.  Thus, the fewest number of codes possible per 10-second interval was one (S or SW), and the largest number of codes possible was five (ERICA). See Table 3 for specific codes and their operational definitions.

Table 3

*Behavioral Codes Used to Define Social Engagement*

| Behavior | Observation Code | Operational Definition of Observed Behavior |
|---|---|---|
| Solitary | S | Not orienting the face or body towards another, or having no one within three feet, with no activity or conversation occurring between at least two people. |
| Solitary Watching | SW | Oriented towards and is watching another who is socially engaged without being engaged. |
| Engaged with Another | E | One's face or body was oriented and within three feet of another, with some activity or conversation occurring between at least two people. |
| Initiated Social Contact | I | Gestured or said something to someone in the room. |
| Responded to Social Contact | R | Replied with a gesture, eye contact, or conversation. |
| Engaged with a child or adolescent | C | Engagement involved a child or adolescent. |
| Engaged with an adult | A | Engagement involved an adult. |

All community group videos were consensus-coded for reliability.  Reliability was measured by dividing the number of 10-second intervals with agreement across coders, divided by the total number of codes (agreement + disagreement).   All coders were trained in a group setting using video recordings with one to four other coders in which all coders present

simultaneously coded the same community group video.  In these sessions, all coders assigned codes to each interval individually and the code assigned by the majority of coders was recorded as the consensus code; in the case of a tie or no agreement, the code was thrown out and not recorded for data analysis.

Live coders were required to attend these sessions until they achieved reliability scores of at least 80% as compared with the group consensus in at least three consecutive training sessions before they could begin live coding independently.  To maintain reliability, coders were required to attend these group coding sessions that were scheduled throughout their time as coders to reduce the possibility of drift in their independent coding.  Coders were required to maintain reliability scores of at least 80% to continue coding independently throughout the study.

Since disagreements in these sessions were resolved by consensus, reliability for the video recorded codes used for data analysis was 100%.  Live coding in community settings was not checked for reliability, as two coders were deemed to be too intrusive for the community group settings that did not allow video.  Average coder reliability in comparison to group consensus in these sessions was 85.06% for live coders and 94.06% for consensus coders (who did not participate in live coding) for a combined average of 89.15%.

**Research Design**

Due to the small number of participants and a lack of precedent in the literature using behavioral observations to measure the effectiveness of GSST in generalized settings, a multiple baseline design was chosen.  Single-subject research has been identified as being a rigorous and scientific method of defining basic behavioral principles and establishing evidence-based practice (Horner et al., 2005). Such a design can provide valuable information with a limited number of participants across different settings as well as a novel and useful way of using

behavioral observations to measure the effectiveness of GSST and peer inclusion training. The primary limitation documented in the literature with the use of a single-subject design is the lack of generalizability to other subjects (Alnahdi, 2013). While this is somewhat accounted for by the multiple baseline design across settings and participants, further studies with a similar design will have to be performed in order to claim such the intervention and method of analysis as evidenced-based.

The primary independent variable is defined as the peer inclusion training detailed above. The primary dependent variable for this study is the level of social engagement measured in the community group settings, and details for how this variable was analyzed are described below.

Many threats to internal and external validity were controlled for by the nature of the design itself, and the integral component of having repeated measurements in the baseline phase, such as maturation, testing effects, instrumentation, and regression. History is often the most significant threat to internal validity in single-subject designs, but the likelihood of having an impact on the results of the study are lessened by the observation of multiple subjects in different settings; participants were not debriefed for any potential history effects. No structures were put in place for a halo effect, but its potential impact was less of a concern because the community coders had no previous experience with the subjects prior to observation.

**Social Validity**

Social validity refers to how the participants perceive an intervention as being helpful (Luiselli & Reed, 2011). This study cannot claim evidence of self-reported social validity, as participants were not assessed regarding how they felt the intervention was benefitting them. This decision was made because children and adolescents with ASD have been found to be very poor at seriation, a cognitive skill necessary to reliably obtain measurements using self-report

methods (Yirmiya & Shulman, 1996). Social validity was also not gathered from other groups who were not participants. Parents did not observe the adolescent GSST sessions directly, and community leaders had no knowledge of these sessions.

**Data Analysis**

Because not all community groups agreed to data collection, not enough participants were included in observational data for meaningful group analysis. As a result, data obtained by behavioral observation in community group settings was primarily analyzed through single-subject visual analysis for changes in level, variability, and trend of social engagement before and after the merit badge instruction. Social engagement was calculated by taking the ten-second intervals coded and grouping them by week of observation. The proportion of 10-second intervals in which a participant is engaged (an E code being present) in these weekly observations was calculated; the same was done for the amount of that engagement that involved reciprocal social interaction with a peer or adult during the ten-second interval (i.e., an IR code being present in that interval).

A quantitative analysis was also implemented using some of the measures described above. To ensure GSST had the intended effect, total scores and individual items of the SCQ-Current from before and after PEERS® instruction were analyzed for changes in communication skills and social functioning using a paired sample *t* test for total scores. The ASSP was also administered prior to and following GSST, and a descriptive analysis of resulting total and subscale scores was performed using a paired sample *t* test. To supplement single-subject visual analysis, community data concerning changes in social engagement following baseline data collection were analyzed for effect size using a Tau-U index (Parker, Vannest, Davis, & Sauber,

2011). Results of measures of IQ, ADOS-2, and SCQ-Lifetime were not analyzed, as their

function was to characterize the participants.

CHAPTER 3

**Results**

This research study sought to address two research questions: whether GSST for

adolescents with ASD produces in gains in learned social skills as measured by parent

perceptions, and whether a peer inclusion training could improve the levels of social engagement

amongst adolescents with ASD in their community groups. In order to answer these questions,

25 adolescents were provided with an evidence-based GSST. Parent perceptions of gains from

GSST were also gathered through the administration of the ASSP and SCQ-Current before and

after GSST.  A peer inclusion training was provided in the community setting of participants to

see if it provided a better opportunity for these adolescents to use their learned social skills. Their

behavior was measured before and after the peer inclusion training in this setting.  This section

details the results of the analyses performed with the data gathered, starting first with the parent

perceptions of gains in social skills and then discussion of the effects of the peer inclusion

training.

Of the 25 initial participants included in the GSST, the researchers were able to obtain

complete data sets (i.e., at least three pre- and post-intervention behavioral observations in

community settings) for eight of these participants.  However, one participant (Richard) was

excluded from data analysis because he did not meet symptomatic criteria for ASD on the

ADOS-2.  Of the seven participants included in data analysis, three had video recorded

community data and four were live coded. In addition to the reasons listed above for community

group data not being collected, some participants were not consistent in attending the community

group activities despite the best efforts of live and video coders to gather data (see Figure 1 for

the progress of participants across the study).  Of the seven participants included for analysis, six

were male and one was female, and they ranged in age from 12 to 17 ($M = 13.86$, $SD = 1.77$).

Demographics for these seven participants are listed in Table 4 (note that all names have been

changed to maintain confidentiality).
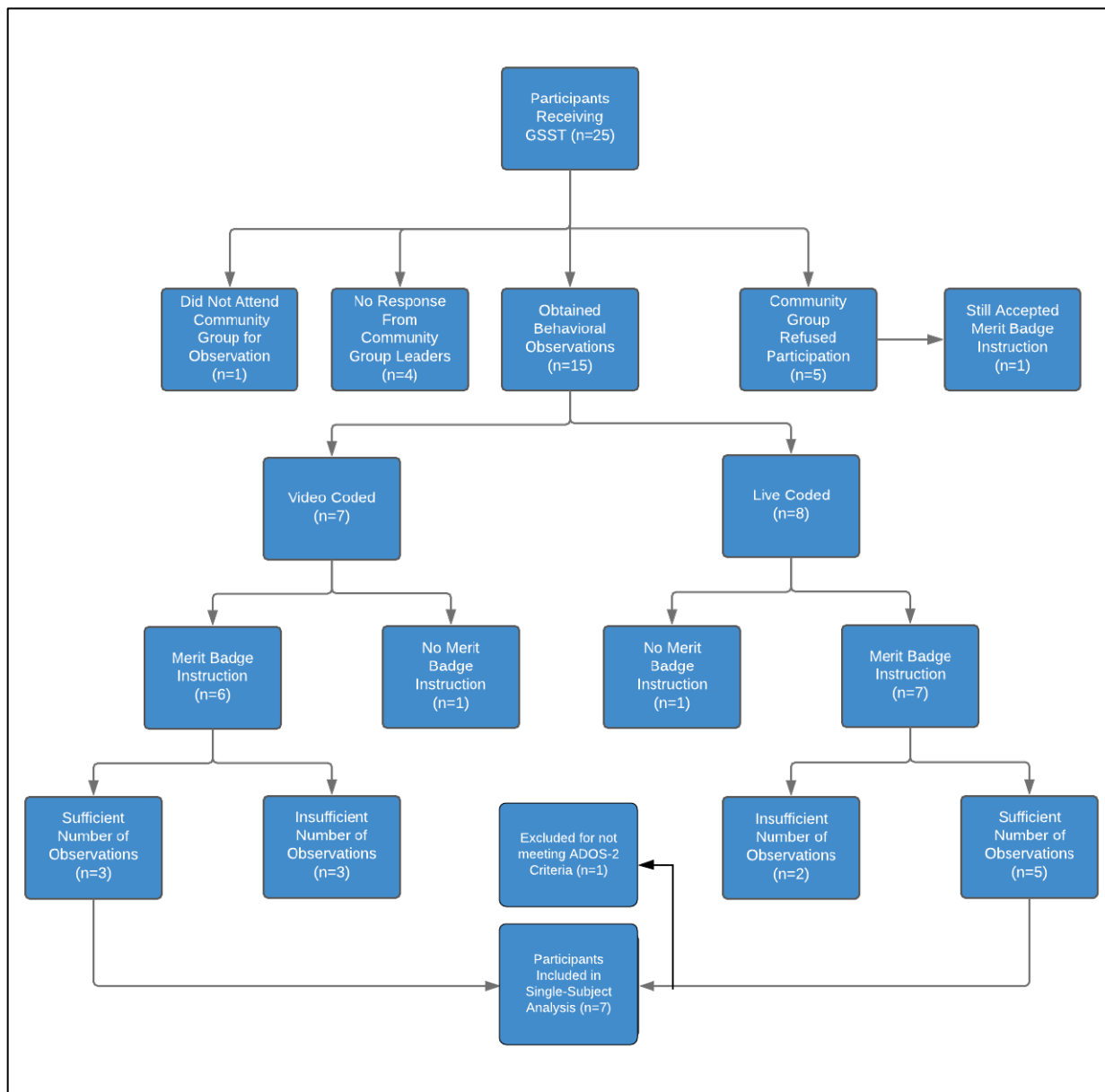


*Figure 1.*  Progress of participants across phases of study.

Table 4

*Participant Demographics for Seven GSST Participants Included in Single-Subject Analysis*

| Participant | Gender | Age | Met Criteria on ADOS-2 | SCQ-Lifetime | FSIQ | VIQ |
| --- | --- | --- | --- | --- | --- | --- |
| Arthur | M | 12 | Yes | 18 | 120 | 121 |
| Barry | M | 17 | Yes | 28 | 116 | 108 |
| Hal | M | 13 | Yes | 30 | 96 | 84 |
| Barbara | F | 12 | Yes | 22 | 59 | 78 |
| Bruce | M | 14 | Yes | 32 | 79 | 76 |
| Clark | M | 15 | Yes | 12 | 125 | 127 |
| Stewart | M | 14 | Yes | 27 | 80 | 106 |

**Parent Perception of Gains in Social Skills**

Approximately one third of the fidelity data were collected regarding the implementation of the PEERS® curriculum. Approximately 78% of the sessions with fidelity data collected were implemented with complete fidelity, and those that were not were still implemented with at least 80% fidelity (considering the number of individual session components implemented with fidelity and those that were not). Participants attended GSST 84% of the time on average; in other words, most participants attended an average of 12 of the 14 GSST sessions.

Complete ASSP data were collected for 17 participants who were included in GSST, but only four were analyzed who also were included in single-subject analysis and also had SCQ-Current data reported (Clark, Barry, Arthur, and Hal). ASSP data showed an increase in total score as well as all subscale scores. However, none of these changes in scores were statistically significant; the subscale of social participation and avoidance subscale trended closer towards significance than the others, which scale involves items regarding involving peers in play, joining peers in their activities, levels of anxiety and solitary activities. Figure 2 displays

changes in total and subscale scores, and Table 5 lists these scores and their values, as well as their statistical significance.
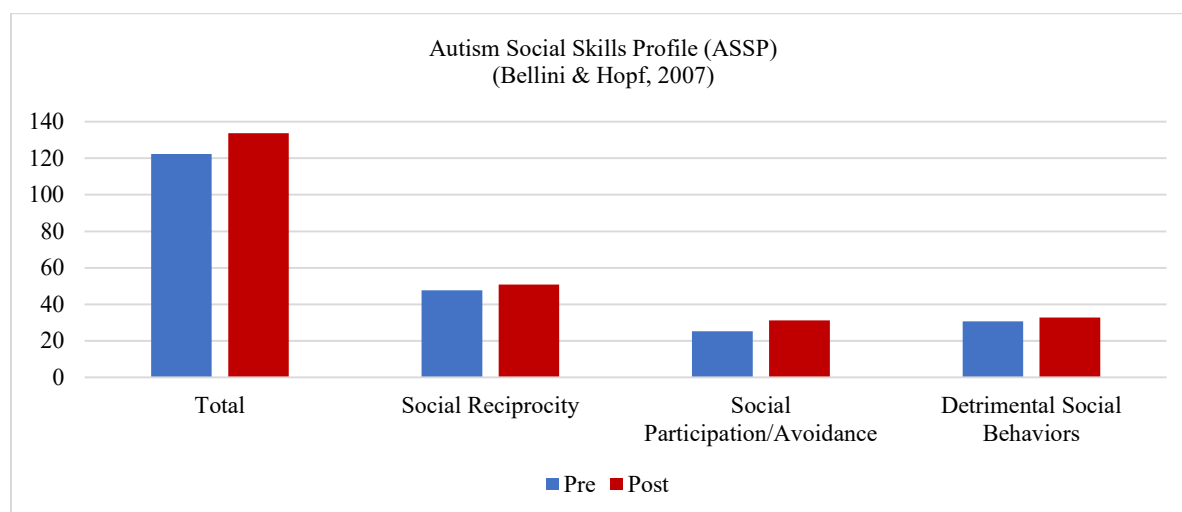


*Figure 2*. Mean ASSP scores pre- and post-GSST, including total and subscale scores. Note: social participation/avoidance scale measures improvement in social participation.

Table 5

*Mean ASSP Scores Pre- and Post-GSST, Including Total and Subscale Scores*

| Scale | Pre | Post | Mean Difference | P-Value |
|---|---|---|---|---|
| Total | 122.25 | 133.75 | 11.50 | 0.34 |
| Social Reciprocity | 47.75 | 50.75 | 3.00 | 0.67 |
| Social Participation/ Avoidance | 25.25 | 31.25 | 6.00 | 0.15 |
| Detrimental Social Behaviors | 30.75 | 32.75 | 2.00 | 0.37 |

Complete SCQ-Current data were collected for 12 participants who were included in GSST, with data from these same four participants named above being included in single-subject analysis.  Consistent with the increase in social skills indicated by the ASSP, SCQ-Current data showed a decrease in ASD symptomatology due to GSST, though not statistically significant.

The mean score prior to GSST was 13.25 and was 10.75 following, resulting in a mean score difference of 2.50.

Individual items on the SCQ-Current were noted that changed in either a positive or negative direction for two or more participants. There were four items that had a pattern of positive change for the four participants analyzed. Following GSST, all four participants' parents reported having a to-and-fro conversation with their child that involves taking turns or building on what they have said that was not reported prior to GSST. This matches anecdotal reports as one of the most noticeable gains: conversation skills. Three responses indicated a decrease in socially inappropriate questions or statements, such as personal questions or making personal comments at awkward times. Three responses also noted an increase in reciprocal smiling. Lastly, two of the four responses indicated a decrease in sensory interests, such as the sight, feel, sound, taste, or smell of things or people. One item changed in a negative direction for two participants. This item assessed whether or not the participants had any particular friends or a best friend at the time.

**Peer Inclusion Training**

There was inconsistency in the effectiveness of the peer inclusion training provided: some benefitted significantly; for some, it seemed to have no impact; and others appeared to have lower levels of engagement after the community group intervention. The number of baseline observations in community group settings for these participants ranged from three to five weeks of observations ($M = 3.71$, $SD = 0.95$). The number of observations that took place after the community group intervention ranged from three to six weeks of observations ($M = 3.57$, $SD = 1.13$).

**Visual analysis.** Visual analysis for each individual participant will be discussed below. Stated here are a few trends observed across participants. Three of the seven participants (Arthur, Barry, and Clark) had a noted decrease in engagement just prior to the intervention. Additionally, the variability of the average level of engagement across weeks appeared to decrease for most participants. Figure 3 shows these seven participants and their behavior observations together organized in a multiple baseline fashion, ordered by week in which behavioral observations commenced in relation to the week of the *PEERS®* curriculum that had been taught prior to the first observation for that participant. Participant visual trends were also analyzed individually. Visual analysis was also considered in the context of ASSP and SCQ-Current trends as a result of GSST when such data were available for that participant.

*Arthur.* Arthur demonstrated a fairly inconsistent pattern of social engagement throughout the intervention despite a notable decrease in engagement just prior to the intervention, followed by a subsequent increase after the intervention. Two weeks post-intervention, Arthur's levels of engagement dropped significantly and never rose above 50% after that point for the rest of his time being observed. Arthur's behavioral observation data is displayed in Figure 4. Such a drop in social engagement was unexpected due to Arthur's decrease in SCQ score (14 to 10) and substantial increase in ASSP scores (Total score: 98 to 124) as measured before and after GSST, indicating that he did benefit from the GSST and is likely to have the capability to interact socially with his peers.

*Barry.* Barry's behavioral observation data is displayed in Figure 5. Barry's levels of engagement appeared to increase leading up to the intervention with the exception of a decrease just prior to the intervention. Overall, Barry's level of engagement in the baseline phase had a fair amount of variability. However, levels of social engagement do appear to be more

consistently in the low range, with some weeks having very low levels of engagement (e.g., less than 10%).  Barry experienced a slight decrease in social communication skills as measured by the ASSP (Total scores: 134 to 123), and a large decrease in ASD symptomatology as measured by the SCQ-Current (17 to six).  It would be difficult to predict how Barry would interact with his peers in his community setting based on his GSST outcome measures, as they indicated both a positive and negative change in ASD symptomatology and social communication skills.
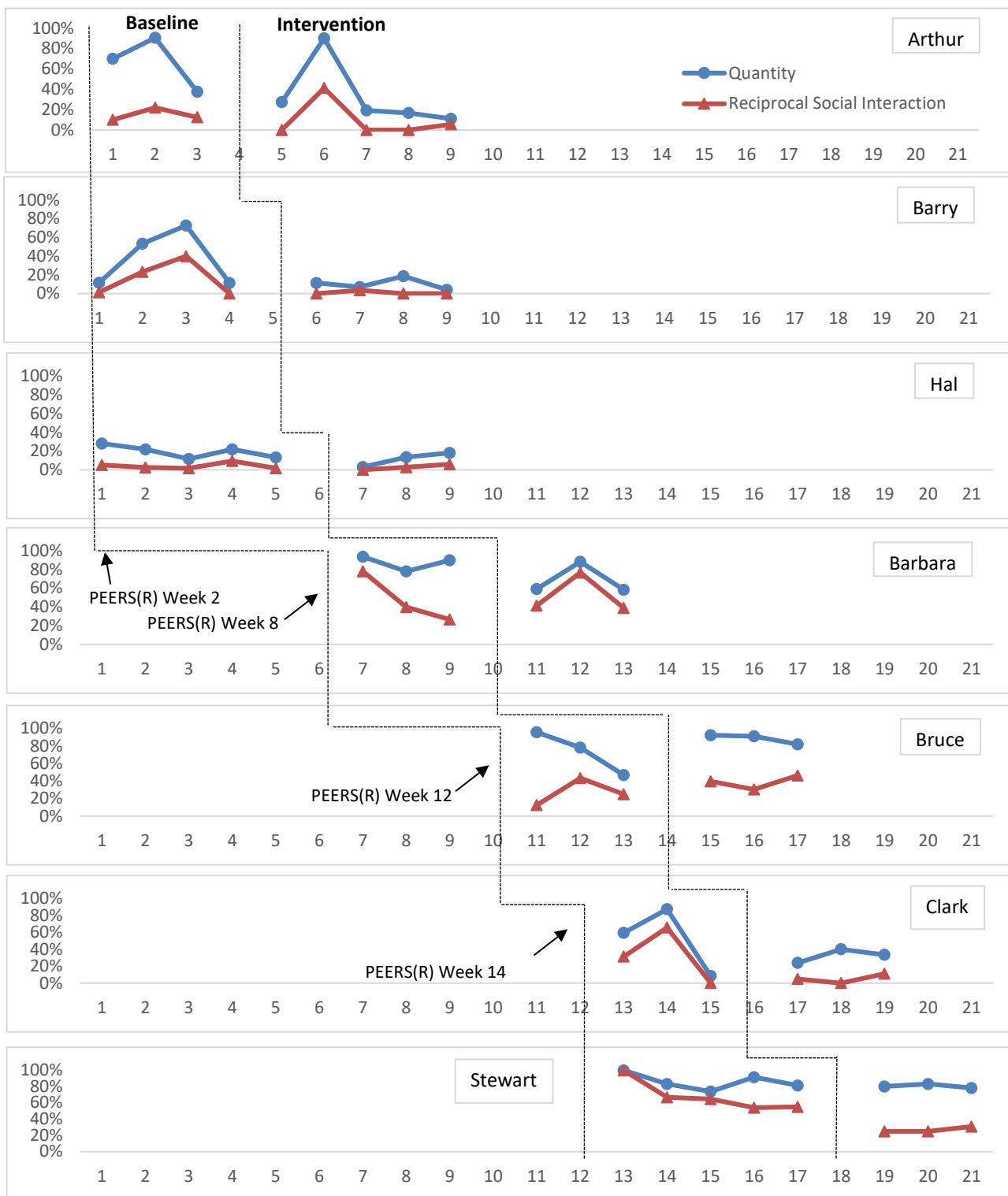
*Figure 3.* Pre- and post-intervention trends for seven participants with complete data sets. Includes overall levels of engagement as well as levels of reciprocal social engagement. Each data point is an average score for a weekly observation period. The first set of dotted lines denote the *PEERS*® lesson they had received prior to the beginning of behavioral observations, and the second set denotes the time of peer inclusionintervention.
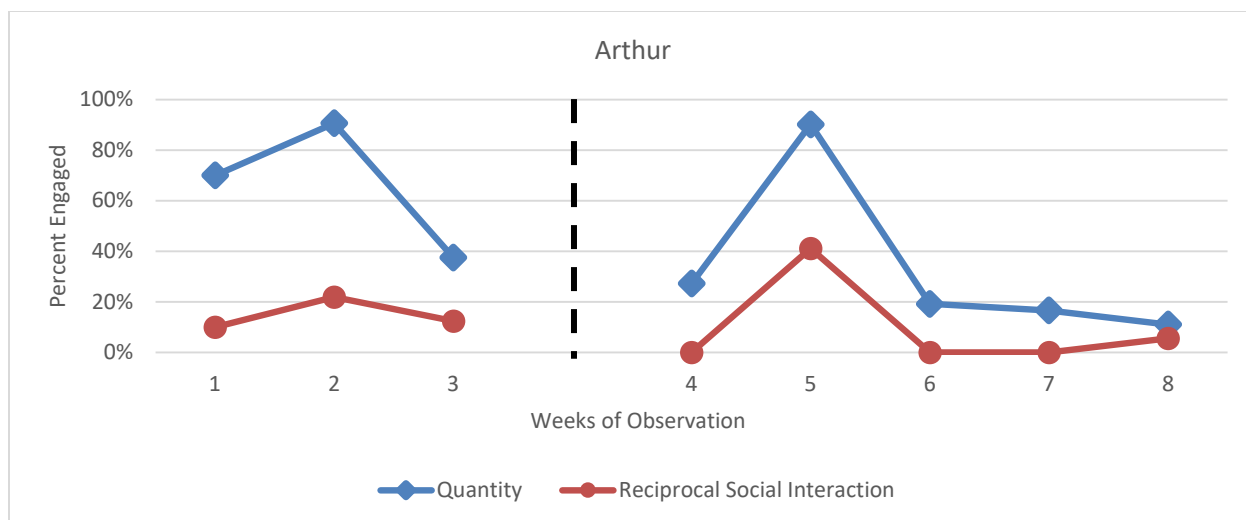
*Figure 4.* Behavioral observations for participant Arthur. Includes percentage of time participant spent engaged each week of observation as well as the proportion of that time that was spent in reciprocal social interaction. The dotted vertical line denotes the time of intervention.

***Hal.*** Hal's behavioral observation data is displayed in Figure 6. Hal showed very low levels of social engagement throughout the intervention, with no data points indicating levels of engagement higher than 30%. Additionally, none of his data points contain a level of reciprocal social interaction exceeding 10%. Overall, he showed very few signs of change that resulted from the intervention. Trends in SCQ-Current scores before and after GSST are similar in that there is minimal to no change observed (a one point increase in SCQ score). However, ASSP trends indicate noticeable gains in social skills after having received GSST as per parent report, with total score increasing by 31 points. Therefore it was expected that Hal would have shown higher levels of engagement in the community setting.
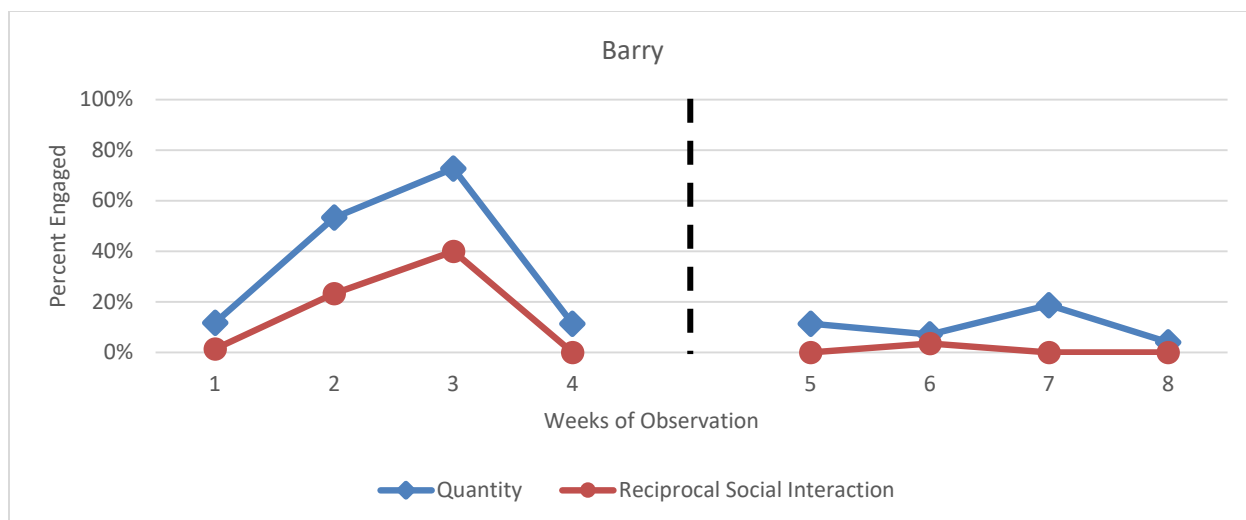
*Figure 5.* Behavioral observations for participant Barry. Includes percentage of time participant spent engaged each week of observation as well as the proportion of that time that was spent in reciprocal social interaction. The dotted vertical line denotes the time of intervention.



*Figure 6.* Behavioral observations for participant Hal. Includes percentage of time participant spent engaged each week of observation as well as the proportion of that time that was spent in reciprocal social interaction. The dotted vertical line denotes the time of intervention.

**Barbara.** Barbara's behavioral observation data is displayed in Figure 7. Barbara was observed to have a relatively high level of engagement throughout both phases of the intervention relative to other participants as it regards both the overall level of engagement and

reciprocal social interaction. There does appear to be a slight trend of decreasing engagement in the baseline phase which was then stabilized following the intervention.
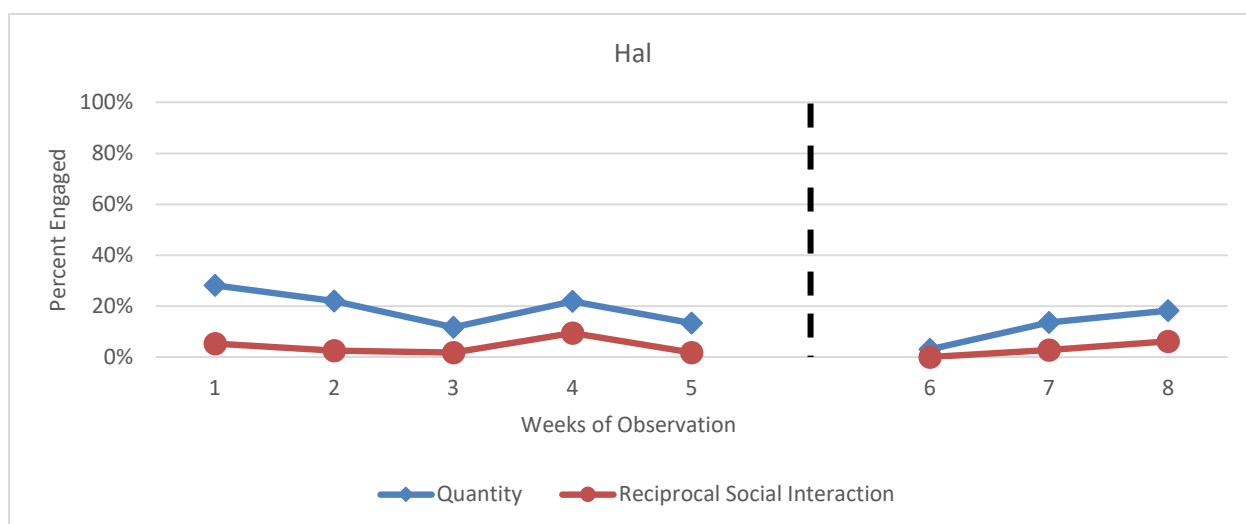


*Figure 7.* Behavioral observations for participant Barbara. Includes percentage of time participant spent engaged each week of observation as well as the proportion of that time that was spent in reciprocal social interaction. The dotted vertical line denotes the time of intervention.

**Bruce.** Bruce's behavioral observation data is displayed in Figure 8. Bruce started the baseline phase with a high level of social engagement in terms of quantity, which saw a pattern of decline until the intervention phase. Both social engagement and reciprocal social interaction were more consistent following the intervention. Bruce's social engagement was at a more consistently high level after the community group intervention, never being engaged less than 80% of the time on a given week after the intervention. Bruce's level of reciprocal interaction, while it did not change significantly, was never as low in the intervention phase as it was in the baseline phase.
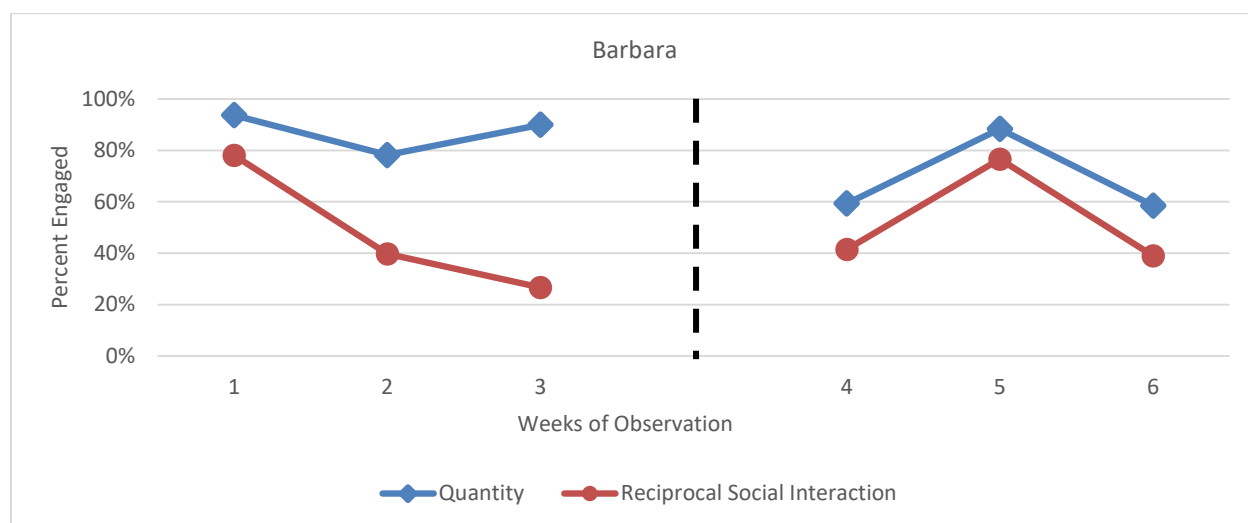
*Figure 8.* Behavioral observations for participant Bruce. Includes percentage of time participant spent engaged each week of observation as well as the proportion of that time that was spent in reciprocal social interaction. The dotted vertical line denotes the time of intervention.

**Clark.** Clark's behavioral observation data is displayed in Figure 9. Clark showed moderate levels of engagement in the baseline phase if averaged out, but a high level of variability in both amount of social engagement (<10% to >80%) and the proportion of that interaction that was reciprocal in nature (0% to 65%). Post-intervention observations showed less range and lower levels of both overall level of engagement (23% to 40%) and reciprocal social interaction (4% to 11%). Clark showed no change in social skills due to the GSST as measured by the ASSP; however, his SCQ score did increase by four points, suggesting a possible slight increase in ASD symptomatology.

**Stewart.** Stewart's level of social engagement did not appear to be greatly impacted by the intervention. However, Stewart's level of reciprocal interaction did appear to decrease in both range and amount following the intervention, as no weeks prior to the intervention were noted below 50% and no data points after the intervention were above 50%. Both social engagement and reciprocal social interaction appear to be more consistent following the

intervention, where prior to the intervention a pattern of slight decline was noted. Stewart's

behavioral observation data is displayed in Figure 10.
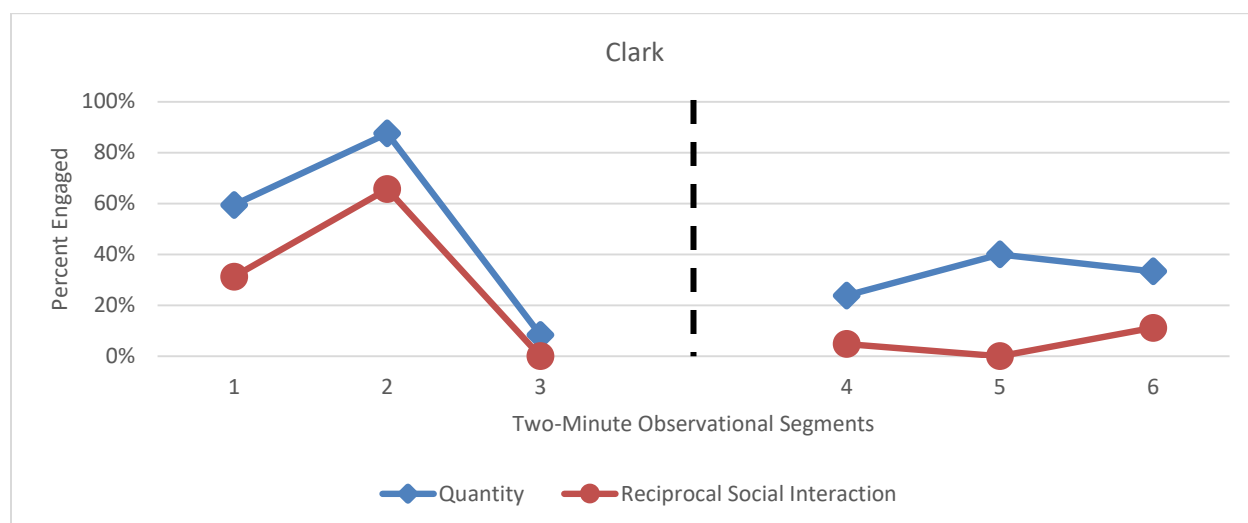


*Figure 9.* Behavioral observations for participant Clark. Includes percentage of time participant spent engaged each week of observation as well as the proportion of that time that was spent in reciprocal social interaction. The dotted vertical line denotes the time of intervention.
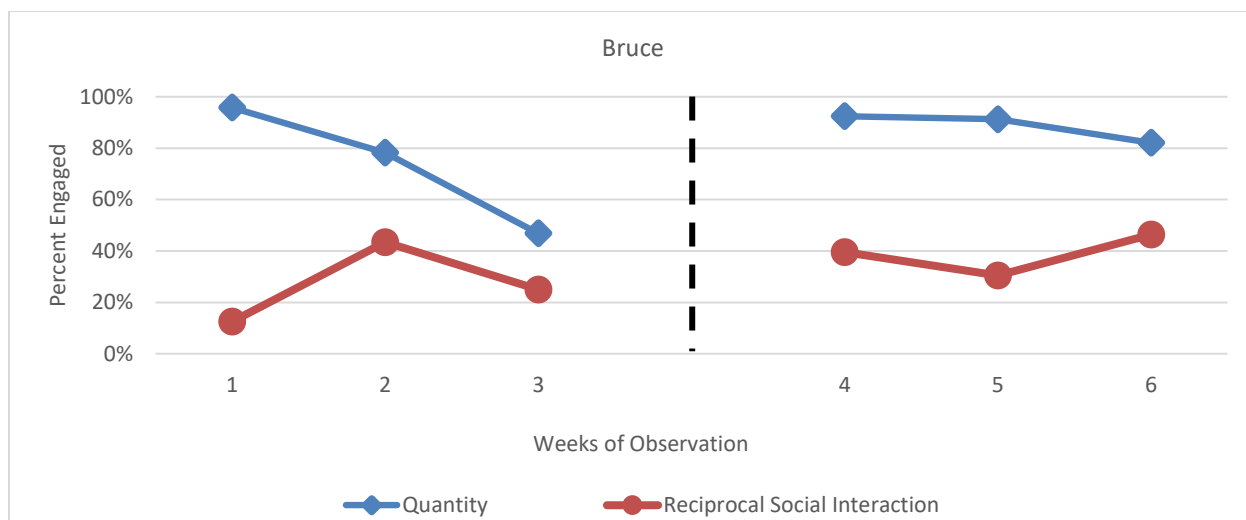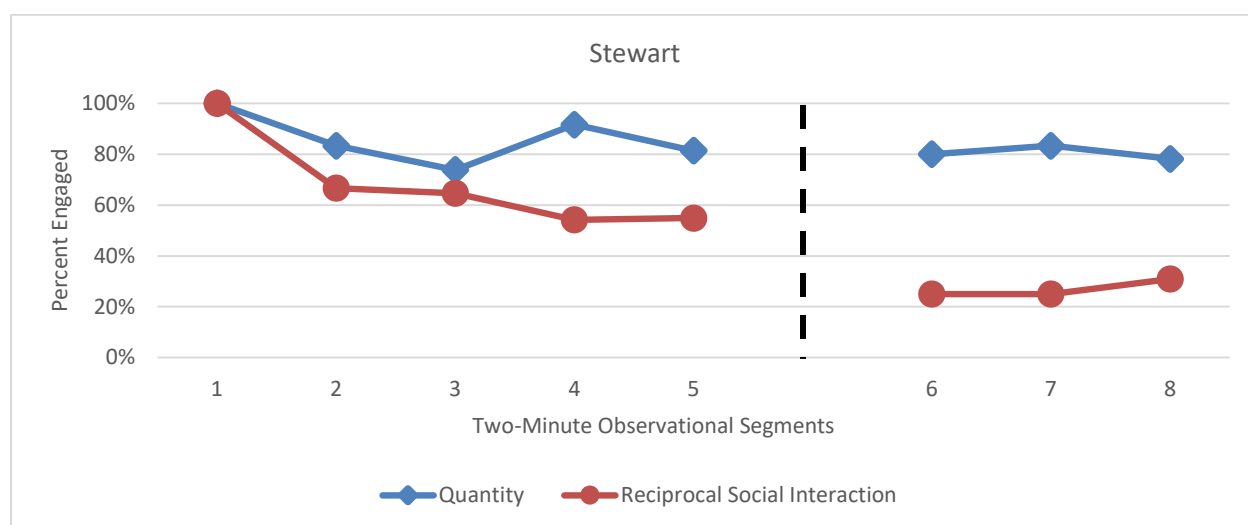


*Figure 10.* Behavioral observations for participant Stewart. Includes percentage of time participant spent engaged in each week of observation as well as the proportion of that time that was spent in reciprocal social interaction. The dotted vertical line denotes the time of intervention.

**Quantitative analysis.** Table 6 contains data from a statistical analysis of the

effectiveness of the peer inclusion training for each of the seven participants included in single-

subject analysis as well as a weighted average of the effect sizes of these seven participants. Overall, quantitative analysis was consistent with single-subject analysis. Statistical analysis shows a slightly more dramatic effect than what was observed per visual analysis and results varied greatly by participant. Tau-U averages indicate more of a negative trend in social engagement.  The weighted Tau-U average for all participants included in single-subject analysis was not statistically significant for quantity of social engagement or reciprocal social interaction. Weighted Tau-U average scores ranged from -0.31 to -0.18, indicating a moderately strong to weak negative trend in social engagement after the intervention.

Table 6

*Tau-U Scores (p-value) Indicating Effectiveness of Intervention as Measured by Level of Social Engagement*

| Participant | Quantity of Social Engagement | Reciprocal Social Interaction (Proportional) | Reciprocal Social Interaction |
|---|---|---|---|
| Arthur | -0.73 (.10) | -0.60 (.18) | *-0.40 (.37)* |
| Barry | -0.69 (.11) | -0.56 (.19) | -0.44 (.38) |
| Hal | *-0.07 (.88)* | -0.07 (.88) | 0.07 (.88) |
| Barbara | -0.78 (.13) | *0.44 (.38)* | *0.89 (.08)* |
| Bruce | *0.67 (.19)* | 0.56 (.28) | 0.11 (.82) |
| Clark | -0.33 (.51) | -0.44 (.38) | -0.44 (.38) |
| Stewart | *-0.13 (.77)* | *-0.47 (.30)* | *-0.60 (.18)* |
| Weighted Average | -0.31 (.08) | -0.18 (.30) | -0.30 (.19) |

*Note.*  Italicized Scores were corrected for baseline trend.

CHAPTER 4

## Discussion

The central purpose of this study was to attempt to expand the generalizability of learned social skills in settings other than that in which they are learned through providing a peer inclusion training in a GSST participant's community group; additionally, the study sought to strengthen the support for gains in social skills due to GSST as measured by parent perception.

**Findings**

**Parent perceptions of gains in social skills.** Consistent with the literature, all participants did benefit from receiving GSST per parent report. Some benefitted in expressed social skills (as measured by the ASSP) and others in ASD symptomatology (as measured by the SCQ); others benefitted in both regards. It is surprising, then, that such low levels of social engagement were observed in community settings. This provides for an interesting observation of an apparent discrepancy between gains in social skills reported by the parents of participants and their levels of engagement in the community settings. One likely explanation for this is that of expectancy effects on the part of the parents, as parents of children with ASD have been suspected of having a high level of expectancy effects (King et al., 2001). As parents are learning in tandem with their children the skills that are being taught in GSST, they may have noted small gains for the first time because they were looking for them or were simply more aware of these behaviors; but when these gains were translated into the community settings, they were relatively insignificant.

SCQ-Current scores would indicate that even when participants decreased in ASD symptomatology, they still struggled to engage socially with their community group. When these results are considered in this light, one possible explanation supported by the findings of

Mikami et al. (2010), discussed previously, is that the negative biases of classmates towards those who experience peer rejection can persist even when those individuals do improve in their social skills. They explain that "once a child has been established as being at the bottom of the social dominance hierarchy, relational processes may perpetuate that child's standing" (p. 126). In light of this possible explanation, it may be more beneficial for children and adolescents who have recently acquired or improved their social skills to have a new social setting in which they can safely practice social communication and fostering relationships, one that is not hindered by previously established negative biases.

These results could also be considered consistent with previous research that has shown that simply working together in a supportive group context can be beneficial for youth with ASD (Bonhert et al., 2016). While the GSST provided in this study meets the criteria of an organized activity established by Bonhert et al. (2016) and Mahoney et al. (2005), and could explain some of the gains resulting from participation in that setting, it is likely that most of the community group settings vary in how well they fit these criteria, particularly in the areas of developing particular skills or achieving goals, and as such may not be the most conducive environment to the continuation of developing social skills. Bonhert et al. (2016), as mentioned above, also speculate from their research findings that these organized activities may be good for broadening a network of social connections, but they are likely not sufficient to increase the quality of friendships established therein. It is possible that the GSST provided to participants was not adequate to make up for this ineffective setting.

**Peer inclusion training.** Results of study further indicate that the while participants generally responded positively to GSST, very few responded to the peer inclusion training as it pertains to their level of social engagement with their peers in a community setting. Overall, the

intervention had mixed results, with the majority of participants experiencing little to no effect as a result. Three participants experienced a decrease in engagement just prior to the intervention. This is perhaps due to the fact that the researchers providing the peer inclusion training were more visible in the community group setting on the last day that behavior was observed prior to receiving peer inclusion training, which was when additional researchers would come to provide the peer inclusion training. Although these researchers made efforts not to interact with or even acknowledge participants in their community settings, participants may have found it more difficult to interact with their peers in a typical fashion. In other words, this decrease could be due to a manifestation of participation or observation effects (e.g., McCambridge, Witton, & Elbourne, 2014), where the participants' behavior is changing because they feel like they are being observed. This does not fully explain these differences, as there was always someone present in the room performing observations, but it may just have been more intrusive or noticeable on that day. However, this would not explain why multiple participants failed to rise back to previous higher levels of engagement after the intervention.

One possible explanation for this could be that the observation effects may have resulted in levels of engagement that were exceptionally high as a sort of novelty effect with having someone present in the room performing observations. In time this novelty effect may have faded and observations would have shown later more of a true baseline. This manifestation of the Hawthorne effect (McCambridge et al., 2014) would not only have a potential impact on participants, but more broadly may impact their peers; they may have felt extra pressure to interact in a prosocial manner when first noticing an observer, yet such pressure may fade after a few weeks when the observer is less noticed by the participant and their peers.

There are a variety of other possible explanation for the mixed results of the peer inclusion intervention, including natural variations in engagement, what peers are doing prior to the start of the activity, illness or other stress, or confounding factors in the community group, including the presence or absence of key social partners. People present at each observation varied, for example. Observations were made across multiple settings and activities. Some days in the community setting may have lent themselves more to inclusive social interaction than others. These and other variables may have affected results.

Considering these potentially confounding variables prompts an investigation into the level of variability across groups and participants. Many contextual factors of these groups that may have had an impact were not recorded and examined, as such was beyond the initial scope of this study. Factors in the community group setting that were not assessed that could have had an impact on the results and merit future investigation include: the age of participants and average age of community group members; the number of peers in the community group; the level of participation of the community group members during the merit badge instruction; and the comorbidity of participants with other disorders or impairments, such as executive function impairments (e.g., Bonhert et al., 2016).

Although our peer inclusion training had many components that have been identified as comprising a successful disabilities awareness intervention, such as being a multi-media and multi-component approach, there are a few components that have been used in other studies that were not used here (Lindsay & Edwards, 2013). The first element that could have had a significant impact on the effectiveness of the intervention is its length. While there are mixed results, current literature does indicate that there may be a threshold of time for such an intervention to have a lasting impact, which may be much longer that the one or two days that

were implemented in this study. The second component which may have produced more positive effects had it been implemented was the use of social interaction with a person with a disability. Due to the confidential nature of the study and the variability in the location of community group settings, it was not deemed feasible to provide this component as part of the peer inclusion training provided; the role-play scenario was deemed sufficient (Lindsay & Edwards, 2013).

Lastly, it is possible that while GSST had a positive impact, that it was simply not sufficient to promote the change needed to increase levels of social engagement in the community setting. One possible component of GSST that may have been such a factor is the dosage and context in which GSST was provided. These two factors are highlighted in the recommendations of Gresham et al. (2001) towards improving social skills training. In such, they suggest that most social skills interventions lack sufficient intensity in their instruction, and while they do not indicate a minimum standard for an acceptable level of intensity, they do indicate that 30 hours of instruction spread across 10 to 12 weeks is insufficient. The time of estimated instruction in GSST provided in this study would likely be closer to 14 hours spread across approximately 14 weeks, and therefore could be lacking in intensity sufficient to promote quality social interactions, even when compounded with the potential effects of the community group intervention provided. The reason the GSST provided was not more time-intensive in this way is that the intent was to use a "treatment-as-usual" manualized intervention, and it was administered exactly as prescribed in the manual. The second criticism of Gresham et al. (2001) is the decontextualized nature of many GSST interventions. That may have been a factor here as well, that the skills learned in GSST or the manner in which they were presented did not provide for a smooth process of generalization to the community group setting.

**Limitations**

There were a number of limitations to this study. First, observations performed in community group settings were overt in nature. This could have had an impact on the behavior of both the participants and their peers. This awareness may manifest itself differently across participants: some may have experienced anxiety and felt less willing to engage; some may have expressed better behavior than usual; and others may have deliberately avoided the observation room or arriving with ample time before the activity in an effort to avoid being recorded. It was clear that some of the participants knew they were being watched, as one participant even commented on how it was difficult to be authentic when he knew he was being recorded. It is unknown whether or not more covert recording procedures would have allowed for more opportunity to view the natural behavior of participants and their peers.

Second, coders used for behavioral observations were not completely blinded to the purpose and other facets of the study. With one exception (the primary author), coders did not participate in interventions in GSST or the community; the coding done by the primary author was only done for one participant, and their levels social engagement did not increase as might be expected with a coder who was not blind to the purposes of the study. All video coders, and most in-person coders were blind as to the date of the community intervention, so were not likely biased towards change afterwards. All video coding was consensus coded to reduce bias as well. In-person codes were, of necessity, not double-coded, but results were not markedly different between in-person and video coding and reliability was checked throughout the study.

Third, no follow-up assessments were utilized that would allow researchers to know if the effects of GSST were long-lasting. As most data measuring the effects of GSST were collected very shortly after GSST was completed, it is possible that any reported gains as a result of GSST

were not long-term and had a minimal impact on the ability of participants to interact with their peers in their community group setting. This would also apply to any potential long-term effects of the peer inclusion training.

Fourth, the GSST used as a part of this study, PEERS®, has been largely studied using a population that spans in age from 13 to 17 years. Consequently, participants in this age range are the only participants for whom there is a strong evidence base. Seven of our 25 GSST participants were age 12 during that phase of the study, and two of our seven participants who received the community group intervention were also 12 years old. The results with these individuals should be interpreted with some caution, as it has not been documented how those below the age of 13 respond to the PEERS® intervention.

Fifth, the participants used in this study comprise a largely male sample. While current estimates indicate that males are diagnosed more frequently with ASD than females at a ratio of 4:1 (e.g., Baio et al., 2018; Brugha et al., 2011; Lai, Lombardo, Auyeung, Chakrabarti, & Baron-Cohen, 2015), it should be noted that results of this study involving females may not be representative of the typical experience for females with ASD.

**Implications for Future Research**

A primary focus of future directions as it relates to this study should be a deeper investigation as to what variables would improve the effectiveness of such an intervention as performed here. More rigorous designs (e.g., randomized controlled trials (RCTs)), which were not possible in this study due to a limited sample size, are needed in order to better determine what the factors are that determine success in these types of groups and interventions; admittedly, however, RCTs are difficult to achieve in community research due to the great amount of variability inherent in the environment, as mentioned above. Some other factors that

could be investigated with more detail in future studies would include a comparison of different

lengths of interventions, different formats (e.g., with more or less of certain components, such as

multimedia, role-play, or interacting with an individual with a disability), group composition

(gender and age in relation to participant), as well as geographic setting (e.g., rural and suburban

settings).

One particular area of interest for the authors of this study is a further investigation of the

influence of adult leaders involved in the community group settings as it relates to the social

engagement of participants.  More than 53% of social engagement occurred with an adult leader

(for five of the seven participants included in single-subject analysis, as two did not have adult

interaction data recorded). While data collection of the adult leaders was beyond the scope of the

current study, informal observations would suggest that adult leaders play a large role in

modeling positive social behaviors for the peers of participants and when adult leaders do not

engage with these adolescents with ASD, it is much less likely that their peers will.  Such

implications have been suggested by Bonhert et al. (2016), stating that the extent to which these

adult leaders understand ASD, support these youth, and actively include them in activities may

impact the experience of adolescents with ASD in these activities.  Video data from this study

could be used to investigate whether or not the social engagement of adult leaders with

participants is a factor in determining the success of the community group intervention

implemented.

**Implications for Practitioners**

The information gained from this study is useful and applicable to providers of social

skills training and those who work with adolescents with ASD. One key implication is that

practitioners cannot expect a short GSST intervention to have generalizing effects, and

practitioners may need to consider a social skills training approach that includes more time and intensity than has been outlined here. Secondly, while there is much more to learn regarding the contextual factors surrounding social success for adolescents with ASD, those working with such individuals should keep in mind that there are more factors to consider than the direct instruction of social skills. Lastly, future researchers and those who implement GSST should consider the use of behavioral observations to see the results of such training, which may provide a truer picture than oft-used questionnaires.

Researchers and practitioners, as well as individuals with ASD and their families can learn from the feasibility challenges experienced throughout the course of this study. Most feasibility challenges were experienced in attempting to work with community group leaders. As mentioned above, they would often refuse participation in the training or would be non-responsive to our attempts to contact them. It may have been more feasible to work through parents instead of directly with community group leaders, but such would require breaking confidentiality of their child's diagnosis. Such disclosure may be necessary to work more effectively with and gain the support of community leaders that work with their child.

**Conclusion**

In conclusion, there is still much research to be done regarding the contextual factors that surround GSST for adolescents, both looking at how GSST itself can become more effective and generalizable, as well as considering the social contextual factors that influence how adolescents with ASD are treated by their peers. The results from this study can be used to promote further research to help practitioners become more effective, with the goal of helping adolescents with ASD thrive socially and as a result find feelings of belonging rather than rejection. We agree with Mikami et al., (2010) that more can be done to help the communities in which these

individuals live work toward a collective model that places responsibility on the society itself to be inclusive.

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APPENDIX A: **Parental Consent and Video Release - GSST**

# Consent to be a Research Subject and Video Release—Parents

## Introduction

This research study is being conducted by Terisa Gabrielsen at Brigham Young University to determine the effects of two interventions for social function for adolescents with disabilities (e.g., autism spectrum disorders, attention deficit/hyperactivity, and brain injuries). You have been invited to participate because you have a child between the ages of 12-17 who has a diagnosis of autism spectrum disorder and is part of a community group that includes individuals with disabilities. **To participate in this research study, your child must be able to do all of the following:**

(a) Have transportation to BYU Provo campus once per week for 8 – 12 weeks to attend a social skills group.
(b) Be a member of a community group such as Scouts, church youth groups, a sports team, etc. that he/she attends regularly.
(c) Have fluent language abilities in English. Language must include talking about things that aren't there (for example, "I saw a funny cat yesterday with a mustache.") Language must also connect two thoughts together (such as "I want to go to the beach, but I don't want to get sunburned.").
(d) Attend a community group or another supervised group activity independently. Parents can help with transportation, but the participant must be able to participate without difficulty in the group without parental assistance.

The study, *Social Skills Direct Instruction and Peer Mediated Training In Community Settings,* has been approved by the Institutional Review Board of BYU.

## Procedures

If you give your consent for you and your child to participate in this research study:

- He or she will participate in a social skills direct instruction group for 8 – 12 weeks on BYU's Provo campus.
- You will be asked to give background information and answer 3 questionnaires that take about 10 minutes each. You will be asked to complete some of the questionnaires up to 4 times.
- Your child will receive an evaluation for autism symptoms that typically takes 1 hour, but may take up to 4 hours. Evaluations will be conducted at BYU and a report will be sent to you.
- Your child's community group will receive peer inclusion instruction for people with disabilities, but your child will not be named specifically.
- Your child will randomly be assigned to start research participation in the social skills group or the peer inclusion instruction group, but will eventually get both interventions.
- Your child will be asked to answer some brief questions (on paper) about who he or she likes to hang out with in the group. Your child's answers will be confidential and will not be shared with the group or anyone other than the researchers.
- Your child will be videotaped in group settings with your permission (see below).
- If your child is on the waiting list for treatment, your child will receive both direct instruction and peer inclusion instruction in a community group setting, but this will begin following the completion of the first session.

| Institutional Review Board | |
|---|---|
| 9-28-2015 | 10-16-2016 |
| Approved | Expires |

## Risks/Discomforts

There are minimal risks or discomforts to you or your child if you choose give your consent for your child to participate in the research.

## Benefits

Participation in the study will include instruction in your child's community group on how to include people with disabilities in social situations. He or she will also receive direct instruction on social skills that may be of benefit. Our understanding of the best ways to help people with autism and other disabilities in social interactions will be increased by your participation in the study.

## Confidentiality

Any information that is collected (i.e., answers to questions, videorecordings) will be kept confidential by research staff and will not be shared with other group members. Research staff will ensure confidentiality of your information by ensuring that no one outside of the research staff has access to your information. All research data will be kept in secure locations and protected with passwords and locks that only the researcher and her staff will have access to. When data is recorded and stored, all identifying information will be removed (e.g., names will be replaced with ID numbers) and the data will be kept in the researcher's locked office in a locked cabinet. Only the researcher has a key to this cabinet. When the results of this research are discussed with other scientists, names and other personal information are not disclosed. If you decide to participate in autism research at BYU in the future, you may ask us to share your information with other researchers to streamline your participation and avoid duplicating some of the tests and questionnaires.

## Participation

Participation in this research study is voluntary. You have the right to withdraw at any time or refuse to participate entirely. Withdrawal from this research study will not affect your participation in any future research studies.

## Questions about the Research

If you have questions regarding this study, you may contact Terisa Gabrielsen at 801-402-5055, 340-A MCKB, Brigham Young University, Provo, UT 84602, Terisa_gabrielsen@byu.edu for further information.

## Questions about Your Rights as Research Participants

If you have questions regarding your rights as a research participant contact IRB Administrator at (801) 422-1461; A-285 ASB, Brigham Young University, Provo, UT 84602; irb@byu.edu.

## Statement of Consent

I have read, understood, and received a copy of the above consent and desire of my own free will to participate in this study.

Name (Printed): _____ Signature _____ Date: _____

| Institutional Review Board | |
| --- | --- |
| 9-28-2015 | 10-16-2016 |
| Approved | Expires |

I give consent for my child, _____ to participate in this research study.

Name (Printed): _____ Signature _____ Date: _____

**<u>Video Recordings</u>**

As part of the research project to study social interactions in group settings, video recordings that include your child will be made during his or her participation in community group settings (e.g, Scouts, youth groups, sports, etc.) and in the social skills group.  These videorecordings will be used to collect data about social interactions in a group setting.  Please indicate what uses of this video you are willing to permit, by initialing next to the uses you agree to and signing at the end. This choice is completely up to you. I will only use the video in the ways that you agree to. In any use of the video, your child will not be identified by name, with the sole exception of the sound of your child's name on the videorecording if another person calls him or her by name as part of social interaction.  Please initial all of the ways we can use your child's videorecordings:

☐ Video can be studied by the research team for use in the research project.

☐ Video can be used for scientific publications.

☐ Video can be shown at scientific conferences or meetings.

☐ Video can be shown in classrooms to college students.

I have read the above descriptions and give my express written consent for the use of the video as indicated by my initials above.

Child's name: _____ Community Group Name: _____

Parent Name and Signature:

Name (Printed): _____ Signature _____ Date: _____

Institutional Review Board

BYU

9-28-2015    10-16-2016
Approved    Expires

APPENDIX B: **Child Assent and Video Permission – GSST Ages 7-14**

# Child Assent and Video Permission (7-14 years old)
# Social Skills Group

### What is this research about?

My name is Terisa Gabrielsen. I want to tell you about a research study I am doing. A research study is a special way to find the answers to questions. We are trying to learn more about social interaction with people who have autism. You are being asked to be in our research project because you are part of a group such as Scouts, church youth group, or a sports team.

If you decide you want to be in this study, this is what will happen.

- You will come to BYU one afternoon for some easy testing (play and answering questions) for about an hour.

- You will go to your group every week as usual.

- You will come to BYU for a different group for about 8 -12 weeks after school.

- You will answer 3 questions about people you like to hang out with in your group. We won't tell anyone else what your answers are. You will have to answer these questions 3 or 4 times.

- You will learn about ways to include people with disabilities in your group.

- You will learn about ways to talk to people on the phone and in person.

- Your groups will be videotaped doing the things they normally do, and you will be on the video.

### Can anything bad happen to me?
We don't think anything bad will happen to you if you decide to do this research study.

### Can anything good happen to me?
You might learn something you didn't know before about how to include people with disabilities in your group. You might also learn something about how to talk to other people. Our researchers will learn about helping people with disabilities in groups like yours.

### Do I have other choices?
You can choose not to be in this study. No one will be mad, and you can do other research studies in the future if you want to.

### Will anyone know I am in the study?
We won't tell anyone you were in this study. When we are finished with the study, we will write a report about what we learned. We won't say your name in the report. No one will be able to guess that you were in the study. If you decide to do any other research studies at BYU, you can ask us to share what we learned with the new researcher so you don't have to answer the same questions for the new researchers.

Ages 7-14

| | Institutional Review Board | |
|---|---|---|
| BYU | 9-28-2015 | 10-16-2016 |
| | Approved | Expires |

**What happens if I get hurt?**

You won't be doing anything different in your group if you are part of this study, so we don't think that anything in the research study will hurt you. You will just be answering questions and being on video doing regular things that your group always does.

**What if I do not want to do this?**

You don't have to be in this study. It's up to you. If you say yes now, but change your mind later, that's okay too. All you have to do is tell us.

Before you say yes to be in this study; be sure to ask **me** to tell you more about anything that you don't understand.

If you want to be in this study, please sign and print your name.

Name (Printed): _____ Signature _____ Date: _____

**Video Recordings**

When we do the research, we will make videos of your group (Scouts, youth groups, sports, etc.) and you will be in them. These videos will help us study people in groups. You may hear people on the video say your name, but we won't tell anyone else your name. We need to show the videos to other researchers, but we won't show the videos to other people if you don't want us to. Please put your initials next to all the choices that are okay:

- [ ]  You can show my videos to the researchers, but not say my name.

- [ ]  You can talk about the videos in a science report, but not say my name.

- [ ]  You can show the video to other scientists, but not say my name.

- [ ]  You can show the video to college students who are studying autism, but not say my name.

I wrote my initials on the ways you can use my videos.

Name (Printed): _____ Signature _____ Date: _____

Ages 7-14

APPENDIX C: **Youth Assent and Video Permission – GSST Ages 15-17**

# Youth Assent (15-17 years old) – Social Skills Group

### What is this study about?

My name is Terisa Gabrielsen. I am from Brigham Young University. I would like to invite you to take part in a research study about how people your age act in groups. Your parent(s) know we are talking with you about the study. This form will tell you about the research study to help you decide whether or not you want to be in it.

In this research study, we want to learn about social interaction with people who have autism spectrum disorders.

### What am I being asked to do?

If you decide to be in the study, we will ask you to

- Come to BYU campus one afternoon for some easy testing (mostly just answering questions).

- Go to your regular community group (your Scout group, church youth group or sports team) as usual.

- Learn about ways to include people with disabilities in your group.

- Come to a social skills group on the BYU Campus for 8 -12 weeks after school (for 1-2 hours after school).

- Answer some easy questions about your community group, you will be asked the same questions 3 or 4 times.

- Give us your permission to record your community group and your social skills group on video.

### What are the benefits to me for taking part in the study?

Taking part in this research study may not help you specifically, but it might help us to learn how to help people with autism interact more with their peers in the community.

### Can anything bad happen if I am in this study?

We think there are very few risks to you if you are in the study, but if you become worried or sad because of some of the questions we ask, you don't have to answer any of the questions you don't want to answer. If you become upset, let us know and we will have our School Psychology graduate students help you with those feelings.

### Who will know that I am in the study?

We won't tell anybody that you are in this study and everything you tell us and do will be private. We don't tell anyone else about your answers to the questions we ask you. Your parent(s) may know that you took part in the study, but we won't tell them anything you said or did, either. When we tell other people or write articles about what we learned in the study, we won't include your name or any other information about the study that would allow people to guess that you were in it. If you decide to do any other research studies at BYU, you can ask us to share what we learned with the new researcher so you don't have to answer the same questions for the new researchers.

## Do I have to be in the study?

No, you don't. The choice is up to you. No one will get angry or upset if you don't want to do this. You can change your mind anytime if you decide you don't want to be in the study anymore.

I have had this research study explained to me and I have decided that I would like to participate in this study.

Name (Printed): _____  Signature_____  Date:_____

## What if I have questions?

If you have questions at any time, you can ask us and you can talk to your parents about the study. We will give you a copy of this form to keep. If you want to ask us questions about the study, contact Terisa Gabrielsen at 801-402-5055, 340-A MCKB, Brigham Young University, Provo, UT 84602, or Terisa.gabrielsen@byu.edu.

### Video Recordings

As part of the research project we will make video recordings of you and the others in your community group and your Social Skills group. These videos will help our researchers study how people in groups interact with each other. You may hear people on the video calling your name, but we won't tell anyone else your name. As part of our study, we may need to show the videos to other researchers and scientists. We won't show the videos to other people if you don't want us to. Please write your initials next to the ways we can use your videos:

_____ You can show my videos to the researchers working on this study, but not say my name.

_____ You can talk about the videos in a scientific paper, but not say my name.

_____ You can show the video to scientists who study autism, but not say my name.

_____ You can show the video to college students who are studying autism spectrum disorders, but not say my name.

I have written my initials on the ways you can use my videos on the lines above.

Name (Printed): _____  Signature_____  Date:_____

APPENDIX D: **Parental Consent and Video Release – Community Group**

# Parent Permission to be a Research Subject and Video Release—Community Group Parents

## Introduction

This research study is being conducted by Terisa Gabrielsen at Brigham Young University to determine the effects of two interventions for social function for adolescents with disabilities (e.g., autism spectrum disorders, attention deficit/hyperactivity, and brain injuries). Your child has been invited to participate because he or she is part of a community group.

The study, *Social Skills Direct Instruction and Peer Mediated Training In Community Settings,* has been approved by the Institutional Review Board of BYU.

## Procedures

If you give your permission for your child to participate in this research study:

- He or she will learn about ways to include people with disabilities in social situations during some of the meetings of your child's community group.
- Your child will be asked to answer some brief questions (on paper) about who he or she likes to hang out with in the group. Your child's answers will be confidential and will not be shared with the group or anyone other than the researchers.
- Your child will be videotaped in his or her community group setting to gather data about social interactions.
- If you choose to not give your permission for videotaping, we will blur out your child's image on all of the video footage before it is used in the study.

## Risks/Discomforts

There are minimal risks or discomforts to you or your child if you choose give your permission for your child to participate in the research.

## Benefits

Participation in the study will include instruction in your child's community group on how to include people with disabilities in social situations. This may or may not benefit you or your child, but our understanding of the best ways to help people with autism and other disabilities in social situations will be increased by your participation in the study.

## Confidentiality

We will not be collecting any personal information about you or your child. We are asking group members to talk about who they like to hang out with in the group, however. Any information that is collected (i.e., answers to questions, videorecordings) will be kept confidential by research staff and

will not be shared with other group members. Research staff will ensure confidentiality of your child's answers when the information is collected by ensuring that no other group members see your child's answers. All research data will be kept in secure locations and protected with passwords and locks that only the researcher and her staff will have access to. When data is recorded and stored, all identifying information will be removed (e.g., names will be replaced with ID numbers) and the data will be kept in the researcher's locked office in a locked cabinet. Only the researcher has a key to this cabinet. If your child wishes to participate in research at BYU in the future, you may ask us to share information with the new researcher if you wish.

## Participation

Participation in this research study is voluntary. You have the right to withdraw at any time or refuse to participate entirely. Withdrawal from this research study will not affect your participation in any future research studies.

## Questions about the Research

If you have questions regarding this study, you may contact Terisa Gabrielsen at 801-402-5055, 340-A MCKB, Brigham Young University, Provo, UT 84602, Terisa_gabrielsen@byu.edu for further information.

## Questions about Your Rights as Research Participants

If you have questions regarding your rights as a research participant contact IRB Administrator at (801) 422-1461; A-285 ASB, Brigham Young University, Provo, UT 84602; irb@byu.edu.

## Statement of Consent

I have read, understood, and received a copy of the above consent and desire of my own free will to participate in this study.


Name (Printed): _____ Signature _____ Date: _____


I give permission for my child, _____ to participate in this research study.


Name (Printed): _____ Signature _____ Date: _____


## Video Recordings

As part of the research project to study social interactions in group settings, video recordings that include your child will be made during his or her participation in community group settings (e.g, Scouts, youth groups, sports, etc.). These videorecordings will be used to collect data about social interactions in a group setting. Please indicate what uses of this video you are willing to permit, by initialing next to the uses you agree to and signing at the end. This choice is completely up to you. I will only use the video in the ways that you agree to. In any use of the video, your child will not be identified

by name, with the sole exception of the sound of your child's name on the videorecording if another person calls him or her by name as part of social interaction. If you choose to not give your permission for videotaping, we will blur out your child's image on all of the video footage before it is used in the study. Please initial all of the ways we can use your child's videorecordings:

       _____ Video can be studied by the research team for use in the research project.

       _____ Video can be used for scientific publications.

       _____ Video can be shown at scientific conferences or meetings.

       _____ Video can be shown in classrooms to college students.

I have read the above descriptions and give my express written consent for the use of the video as indicated by my initials above.


Child's name: _____ Community Group Name: _____


Parent Name and Signature:


Name (Printed): _____      Signature _____      Date: _____

APPENDIX E: **Child Assent and Video Permission – Community Group Ages 7-14**

# Child Assent and Video Permission (7-14 years old)
# Community Group

### What is this research about?

My name is Terisa Gabrielsen. I want to tell you about a research study I am doing. A research study is a special way to find the answers to questions. We are trying to learn more about ways that people have fun being with other people in groups. You are being asked to be in our research project because you are part of a group such as Scouts, church youth group, or a sports team.

If you decide you want to be in this study, this is what will happen.

- You will go to your group every week as usual.

- You will answer 3 questions about people you like to hang out with in your group. We won't tell anyone else what your answers are. You will have to answer these questions 3 or 4 times.

- You will learn about ways to include people with disabilities in your group.

- Your groups will be videotaped doing the things they normally do, and you will be on the video.

### Can anything bad happen to me?

We don't think anything bad will happen to you if you decide to do this research study.

### Can anything good happen to me?

You might learn something you didn't know before about how to include people with disabilities in your group. You might also learn something about how to talk to other people. Our researchers will learn about helping people with disabilities in groups like yours.

### Do I have other choices?

You can choose not to be in this study. No one will be mad, and you can do other research studies in the future if you want to.

### Will anyone know I am in the study?

We won't tell anyone you were in this study. When we are finished with the study, we will write a report about what we learned. We won't say your name in the report. No one will be able to guess that you were in the study. If you decide to do any other research studies at BYU, you can ask us to share what we learned with the new researcher so you don't have to answer the same questions for the new researchers.

### What happens if I get hurt?

You won't be doing anything different in your group if you are part of this study, so we don't think that anything in the research study will hurt you. You will just be answering questions and being on video doing regular things that your group always does.

## What if I do not want to do this?

You don't have to be in this study. It's up to you. If you say yes now, but change your mind later, that's okay too. All you have to do is tell us.

Before you say yes to be in this study; be sure to ask **me** to tell you more about anything that you don't understand.

If you want to be in this study, please sign and print your name.

Name (Printed): _____ Signature _____ Date: _____

## Video Recordings

When we do the research, we will make videos of your group (Scouts, youth groups, sports, etc.) and you will be in them. These videos will help us study people in groups. You may hear people on the video say your name, but we won't tell anyone else your name. We need to show the videos to other researchers, but we won't show the videos to other people if you don't want us to. Please put your initials next to all the choices that are okay:

_____ You can show my videos to the researchers, but not say my name.

_____ You can talk about the videos in a science report, but not say my name.

_____ You can show the video to other scientists, but not say my name.

_____ You can show the video to college students who are studying autism, but not say my name.

I wrote my initials on all the ways you can use my videos.

Name (Printed): _____ Signature _____ Date: _____

APPENDIX F: **Youth Assent and Video Permission – Community Group Ages 15-17**

# Youth Assent (15-17 years old) – Community Group

### What is this study about?

My name is Terisa Gabrielsen. I am from Brigham Young University. I would like to invite you to take part in a research study about how people your age act in groups. Your parent(s) know we are talking with you about the study. This form will tell you about the research study to help you decide whether or not you want to be in it.

In this research study, we want to learn about social interaction with people who have autism spectrum disorders.

### What am I being asked to do?

If you decide to be in the study, we will ask you to

- Go to your regular community group (your Scout group, church youth group or sports team) as usual.

- Learn about ways to include people with disabilities in your group.

- Answer some easy questions about your community group, you will be asked the same questions 3 to 4 times.

- Give us your permission to record your community group on video.

### What are the benefits to me for taking part in the study?

Taking part in this research study may not help you specifically, but it might help us to learn how to help people with autism interact more with their peers in the community.

### Can anything bad happen if I am in this study?

We think there are very few risks to you if you are in the study, but if you become worried or sad because of some of the questions we ask, you don't have to answer any of the questions you don't want to answer. If you become upset, let us know and we will have our School Psychology graduate students help you with those feelings.

### Who will know that I am in the study?

We won't tell anybody that you are in this study and everything you tell us and do will be private. We don't tell anyone else about your answers to the questions we ask you. Your parent(s) may know that you took part in the study, but we won't tell them anything you said or did, either. When we tell other people or write articles about what we learned in the study, we won't include your name or any other information about the study that would allow people to guess that you were in it. If you participate in studies at BYU in the future, you can ask us to share your information with the new researchers if you wish.

### Do I have to be in the study?

No, you don't. The choice is up to you. No one will get angry or upset if you don't want to do this. You can change your mind anytime if you decide you don't want to be in the study anymore.

I have had this research study explained to me and I have decided that I would like to participate in this study.

Name (Printed): _____ Signature_____ Date: _____

## What if I have questions?

If you have questions at any time, you can ask us and you can talk to your parents about the study. We will give you a copy of this form to keep. If you want to ask us questions about the study, contact Terisa Gabrielsen at 801-402-5055, 340-A MCKB, Brigham Young University, Provo, UT 84602, or Terisa.gabrielsen@byu.edu.

## Video Recordings

As part of the research project we will make video recordings of you and the others in your community group. These videos will help our researchers study how people in groups interact with each other. You may hear people on the video calling your name, but we won't tell anyone else your name. As part of our study, we may need to show the videos to other researchers and scientists. We won't show the videos to other people if you don't want us to. Please write your intials by the ways we can use your videos:

_____ You can show my videos to the researchers working on this study, but not say my name.

_____ You can talk about the videos in a scientific paper, but not say my name.

_____ You can show the video to scientists who study autism, but not say my name.

_____ You can show the video to college students who are studying autism spectrum disorders, but not say my name.

I have written my initials on the ways you can use my videos on the lines above.

Name (Printed): _____ Signature_____ Date: _____

## APPENDIX G: **Participant Demographics**

*Participant Demographics for 25 GSST Participants*

| Participant | Gender | Age | Met Criteria on ADOS-2 | SCQ-Lifetime | FSIQ | VIQ |
|---|---|---|---|---|---|---|
| Arthur | M | 12 | Yes | 18 | 120 | 121 |
| Barbara | F | 12 | Yes | 22 | 59 | 78 |
| Barry | M | 17 | Yes | 28 | 116 | 108 |
| Bruce | M | 14 | Yes | 32 | 79 | 76 |
| Clark | M | 15 | Yes | 12 | 125 | 127 |
| Cyrus | M | 13 | No | 18 | 103 | 100 |
| Diana | F | 14 | Yes | 26 | 87 | 89 |
| Edward | M | 12 | No | 20 | 81 | 84 |
| Elliott | M | 14 | Yes | 24 | 101 | 121 |
| Floyd | M | 12 | Yes | 29 | 124 | 106 |
| Hal | M | 13 | Yes | 30 | 96 | 84 |
| Harleen | F | 12 | Yes | 32 | 88 | 92 |
| Harvey | M | 13 | Yes | 28 | 94 | 90 |
| Hugo | M | 11 | Yes | 22 | 103 | 118 |
| Jervis | M | 13 | Yes | 31 | 113 | 121 |
| Julian | M | 14 | Yes | 23 | 106 | 111 |
| Kirk | M | 12 | Yes | 21 | 123 | 124 |
| Nora | F | 15 | Yes | 15 | 97 | 108 |
| Oswald | M | 14 | Yes | 21 | 87 | 106 |
| Richard | M | 13 | No | 10 | 72 | 103 |
| Roman | M | 13 | Yes | --[a] | 83 | 111 |
| Selina | F | 16 | Yes | 27 | 104 | 100 |
| Stewart | M | 14 | Yes | 27 | 80 | 106 |
| Thalia | F | 12 | Yes | 25 | 116 | 106 |
| Waylon | M | 15 | Yes | 16 | 106 | 108 |
| Mean (SD) | N/A | 13.40 (1.44) | N/A | 23.21 (6.18) | 98.52 (17.51) | 103.92 (14.45) |

[a] Data could not be obtained

## APPENDIX H: **PEERS® Fidelity Checklist**

PEERS® FIDELITY CHECKLIST
Today's date _____

| TEEN SESSION<br>Instructor(s): | | PARENT SESSION<br>Instructor(s): | |
|---|---|---|---|
| Homework Review | | Homework Review | |
| Didactic Lesson (with Role-Play) | | Go over Parent Handout | |
| Behavioral-Rehearsal | | Homework Assignment | |
| Practice of Skills (e.g., Jeopardy) | | | |
| Homework Assignment | | | |
| Reunification with Parent | | Reunification with Teen | |

Attendance

TEENS/                  PARENT

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

APPENDIX I: **Behavioral Coding Sheet**

Behavioral Coding Sheet

Participant ID (not real name) _____    Date _____ Location _____

Coder Name _____ Special Notes _____

| Start Time: | 0:0 – 0:10 | :11 - :20 | :21 - :30 | :31 - :40 | :41 - :50 | :51 - :60 | Notes |
|---|---|---|---|---|---|---|---|
| 0:00 –1:00 | | | | | | | |
| 1:01 – 2:00 | | | | | | | |
| 2:01 – 3:00 | | | | | | | |
| 3:01 – 4:00 | | | | | | | |
| 4:01 – 5:00 | | | | | | | |
| 5:01 – 6:00 | | | | | | | |
| 6:01 – 7:00 | | | | | | | |
| 7:01 – 8:00 | | | | | | | |
| 8:01 – 9:00 | | | | | | | |
| 9:01 – 10:00 | | | | | | | |
| 10:01 – 11:00 | | | | | | | |
| 11:01 – 12:00 | | | | | | | |
| 12:01 – 13:00 | | | | | | | |
| 13:01 – 14:00 | | | | | | | |
| 14:01-15:00 | | | | | | | |
| 15:01 – 16:00 | | | | | | | |
| 16:01 – 17:00 | | | | | | | |
| 17:01 – 18:00 | | | | | | | |
| 18:01 – 19:00 | | | | | | | |
| 19:01 – 20:00 | | | | | | | |

S = Solitary = no face or body orientation to anyone else, no one within 3 feet, no activity or conversation occurring between at least 2 people
SW = Solitary Watching = oriented towards and is watching another who is socially engaged.
E = Engaged with another = face or body oriented and within 3 feet, some activity or conversation occurring between at least 2 people
R = Responded to social contact = replied with a gesture, eye contact, or conversation
I = initiated social contact = gestured or said something to someone in the room
C = Engaged with child or adolescent
A= Engaged with adult