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Using Explicit Social Skills Instruction Combined with a Restricted Interest Group to Increase the Frequency of Social Skills in Students with Autism

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USING EXPLICIT SOCIAL SKILLS INSTRUCTION COMBINED WITH A
RESTRICTED INTEREST GROUP TO INCREASE THE FREQUENCY OF SOCIAL
SKILLS IN STUDENTS WITH AUTISM

A Specialist Project
Presented to
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Of the Requirements for the Degree
Specialist in Education

By
Krista S. Cummings

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USING EXPLICIT SOCIAL SKILLS INSTRUCTION COMBINED WITH A
RESTRICTED INTEREST GROUP TO INCREASE THE FREQUENCY OF SOCIAL
SKILLS IN STUDENTS WITH AUTISM

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CONTENTS

List of Figures.....	v
Abstract.....	vi
Introduction.....	1
Method.....	13
Participants.....	13
Materials.....	14
Setting.....	14
Dependent Variables.....	15
Research Design and Procedures.....	16
Baseline.....	17
Intervention.....	17
Interobserver Agreement.....	21
Results.....	22
Discussion.....	26
References.....	30

LIST OF FIGURES

Figure 1. Donald's Data.....	23
Figure 2. Ted's Data.....	24

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The literature suggests that adolescents with Autism Spectrum Disorder (ASD) are characterized by restricted interests and deficits in social skills (White, Keonig, & Scahill, 2007). Due to the deficits associated with ASD, adolescents with ASD do not typically engage in social interactions at a rate similar to their same age typically-developing peers (Wagner, Cadwallader, Garza, & Cameto, 2004). This study assessed whether explicit social skills instruction in a restricted interest group in an afterschool club setting increased the frequency of specific social skills in two students identified with ASD. A multiple baseline experimental design was implemented across behaviors. During baseline measures, the participants showed minimal social interactions. During intervention, results showed increases in the social skills being measured. These results have implications for understanding factors related to developing social skills in adolescents with ASD.

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental disability characterized by restricted interests and repetitive behaviors and deficits in communication and social reciprocity skills (Christensen et al., 2012; White et al., 2007). Due to the prevalence of children identified with ASD (1 in 68 children; Center for Disease Control and Prevention, 2014), there is a need for interventions targeting the specific characteristics children and adolescents with ASD display.

Characteristics of Autism Spectrum Disorder

According to the *Diagnostic and Statistical Manual of Mental Disorders* [DSM-V, American Psychiatric Association (APA), 2013], there are five criteria that make up the diagnostic criteria for ASD. The first diagnostic criterion includes deficits, which persist over time, in social communication and social interaction. These deficits can include, but are not limited to, abnormal social approach, failure to grasp the pragmatics of normal conversation, failure to start or participate in social interactions, abnormal eye contact and body language, failure to develop and maintain social relationships, difficulties initiating or maintaining friendships, and a lack of interest in peers. The second diagnostic criterion includes restricted and repetitive behaviors and interests. Examples of this type of behavior include, but are not limited to, repetitive speech, insistence on adhering to routines, highly restricted perseverative interests with an abnormal intensity, and unusual sensory interests. The third criterion covers the age of onset and stipulates that the symptoms must be present in the early developmental period. The fourth criterion covers the impact of the disability and indicates that the symptoms cause clinically significant impairment in certain areas of functioning. The final criterion stipulates that the symptoms are not better explained by another disability. For the

purposes of this research, the focus will be on the first and second criterion relating to the characteristics children with ASD display — social and communication deficits and adherence to perseverative interests (APA, 2013).

Social Skills and Communication Deficits

Social skills and communication deficits are core features of ASD.

Communication deficits can be evident in children as young as 12 months old (Mitchell et al., 2006). Communication deficits in young children with ASD may include difficulty producing and understanding words, phrases, and gestures (Mitchell et al., 2006). As children with ASD get older, the communication deficit often becomes more evident in difficulty with social communicative behaviors. According to Yeo and Teng (2015), social communicative behaviors are a set of abilities that facilitate children in responding to social requests in acceptable ways. These behaviors can include difficulty with pragmatic language and how to appropriately engage in conversational turns and topics.

Pragmatic language. A specific area of difficulty with social skills for people with ASD is an impaired use and understanding of pragmatic language. Pragmatic language is language used for social purposes (Klusek, Martin, & Losh, 2014; Martin & McDonald, 2003); for example, using language for different purposes (e.g., greeting, informing, requesting), changing language according to the situation (e.g., talking at school instead of at home), and following the rules of conversation (e.g., taking turns, staying on topic, using facial expressions and eye contact; Klusek, Martin, & Losh, 2014). Pragmatic language is present in a number of different social interactions and can result in a variety of impairments. Problems with pragmatic language are likely to be recognized in conversations that require the exchange of information between at least two

people (Young, Diehl, Morris, Hyman, & Bennetto, 2005). For example, individuals with ASD may have difficulties in numerous aspects of social conversation, including: choosing appropriate diction, maintaining topics, perseveration, and including irrelevant details (Klusek et al., 2014). Additionally, Botting and Conti-Ramsden (1999) found that “children with primary pragmatic language impairments have been described as having superficially normal language development, unusual language constructions, difficulty using pragmatic cues in conversation, difficulty in turn-taking, and complex difficulties with comprehension” (p. 372).

Conversational turns and topics. Chin and Bernard-Opitz (2000) found that individuals with ASD may demonstrate an inability to take turns in conversations or wait for their turn without interrupting their conversational partner which can impair their ability to communicate effectively. As adolescents grow older, one complex skill that can be difficult for students with ASD is maintaining a topic during a conversational turn. “Topic maintenance is a complex skill, requiring the ability to flexibly employ grammatical skills, understand and produce meaningful semantic relationships, recognize shared information with conversational partners, [and to] notice and interpret the significance of changing contextual cues” (Landa, 2000, p. 135 - 136). This skill can be difficult for students with ASD because of the complexity. People with ASD may switch topics when the current conversation reminds them of something else or end a conversational turn prematurely. Individuals with ASD may have a poorer maintenance of others’ topics as opposed to their own (Landa, 2000).

Maintaining a conversational topic can be especially difficult for students with ASD if they have perseverative interests. Perseverative interests are characterized by an

interest to an exceptional degree, or an interest beyond a desired point (Merriam-Webster, 2016). Individuals with ASD may perseverate on a certain topic when having a conversation with another person (Ross, 2002). When presenting information on a topic of their choosing, individuals with ASD have a tendency to present a series of detailed facts rather than a story (Landa, 2000). During this conversation, people with ASD do not include details of a cohesive and relevant conversation (Paul, Orlovski, Marcinki, & Volkmar, 2009). This results in individuals with ASD not responding to others appropriately. Ultimately, these deficits in pragmatic language can affect an individual's ability to make and maintain meaningful relationships (Klusek et al., 2014).

Diction. Another way in which individuals with ASD have issues with social interactions is their inability to choose appropriate diction. This involves the words and phrases individuals choose to use in a conversation, and their style of enunciation in speaking (Ghaziuddin & Lenore, 1996). People with ASD may choose inappropriate words or phrases when communicating with another person. People with ASD are also characterized as having a different tone of voice when speaking and they are less able to identify emotions expressed by others through tone of voice (Wang, Lee, Sigman, & Dapretto, 2006).

Restricted and Repetitive Interests

Restricted and repetitive behaviors are another core feature of ASD. According to Leekam, Prior, and Uljarevic (2011), "restricted and repetitive behaviors form a class of behaviors characterized by high frequency, repetition in an invariant manner, and [a] desire for sameness in the environment" (p. 562). The restrictedness of these behaviors is evidenced by a narrow focus, perseveration in interests and activities, an insistence on

sameness, and inflexibility of routines. The repetition of these behaviors is evidenced by repetitive motor movements, repetitive speech, rituals, and routines. Some children with ASD engage in self-stimulatory or stereotypic, motor behaviors for sensory purposes (Wolery, Kirk, & Gast, 1985). For the purposes of this research, there will be a stronger focus on the types of restricted and repetitive behaviors evidenced by a preoccupation with restricted interests. Restricted interests are topics that individuals with ASD pursue with a high intensity and extreme focus (Mancil & Pearl, 2008). Children with ASD often develop intense interests with particular subjects or activities. These subjects or activities are often pursued by the child obsessively, sometimes at the point of disregarding all other activities. Perseverative interests can develop in children with ASD as young as 2 years old (Bashe & Kirby, 2001).

Challenges of Youth with ASD

Due to the impairments in social communication, children with ASD face challenges within day-to-day life. These children have difficulties with peer interactions which result in adolescents with ASD rarely participating in social activities both in and outside of school (Wagner et al., 2004). Adolescents with ASD also report feeling lonely, may be at a greater risk for social isolation, and suffer from academic underachievement due to poor social skills. Individuals with ASD report a desire to participate in more social interactions (Koegel, Kim, Koegel, & Schwartzman, 2013); however, without sufficient support, these individuals are unable to have the types of relationships they would like.

Interventions in the area of social skills are important due to the wide ranging detrimental impact of social skill deficits in youth with ASD (White et al., 2007). Deficits

in social skills negatively influence the relationships people with ASD have. It is difficult for people with ASD to make friends, and more difficult to maintain friendships once established. The lack of social relationships established by people with ASD leads to them pulling away from social opportunities; “Social skills deficits impede one’s ability to establish meaningful social relationships, which often leads to withdrawal and a life of social isolation” (Bellini, Peters, Benner, & Hope, 2007, p. 153). Deficits in social skills are also correlated with lower academic achievement and a heightened risk for school dropout among adolescents and emerging adults in high school (Kavale & Forness, 1996). Social skill interventions have the ability to increase the social interactions in which adolescents with ASD engage (Koegel et al., 2013). Therefore, challenges youth with ASD face due to social skills deficits and the effect these deficits have on people with ASD can be reduced or potentially eliminated through the use of effective interventions.

Autism Spectrum Disorder Social Skills Interventions

Due to the impact ASD has on social skills; individuals with ASD are often in need of interventions that target the improvement of social skills. Social skills interventions are designed to instruct children in the skills necessary to participate effectively in their social environment (Rao, Beidel, & Murray, 2008). Many studies have demonstrated that interventions can improve targeted social skills in adolescents with ASD. For example, White et al. (2007) found that there are several promising strategies that could potentially be used in order to develop and improve the social skills in children with ASD. This study examined several social skills (e.g., increase social initiations) and strategies for teaching these skills. For example, the promising strategies for increasing

social interactions are as follows: make social rules clear and concrete, model age-appropriate initiation strategies, use natural reinforcers for social initiations, and teach simple social ‘scripts’ for common situations.

Additionally, social stories, peer-mediated, and video-modeling interventions are all evidenced-based practices for teaching social skills to adolescents with ASD (Dyches, Prater, & Leininger, 2009). In a study by Tse, Strulovitch, Tagalakis, Meng, and Fombonne (2007), social skills groups were found to be an effective way of helping adolescents with ASD develop social skills. Based on a meta-analysis examining social skills interventions for children with ASD, social skills are difficult to improve; therefore social skills interventions are minimally effective for children with ASD. It is not uncommon for social skills interventions to produce low intervention effects (Bellini et al., 2007). However, based on the research, a wide variety of techniques incorporating social skills training are being used; ranging from peer strategies to explicit instruction to incorporating perseverative interests (Rao et al., 2008).

Social skills interventions that utilize neurotypical peers. Children with ASD have been found to be responsive to a number of social skills interventions. There have been many successful strategies involving the inclusion of typically-developing peers (Rogers, 2000). Research supports the use of peer strategies when teaching social skills to youth with ASD. According to Kamps et al. (1992), “there has been an increase in research investigations that use peer strategies (e.g., modeling, prompting, tutoring) as a vehicle for increasing learning and improving social relationships of students with ASD and other developmental disabilities” (p. 281). Peer-mediated strategies usually involve neurotypical peers modeling and reinforcing social interactions. Several studies

demonstrate the effectiveness of peer-mediated approaches for increasing the frequency of social interactions in adolescents with ASD (DiSalvo & Oswald, 2002).

Barry et al. (2003) used direct instruction in addition to peer education as a way to improve social skills, such as greetings, conversations, and play skills. Participants consisted of four children with high-functioning ASD, who were between the ages of six and nine years old. The participants were explicitly taught specific social skills using a social script for greeting, conversation, and play interactions. For example the social script for greeting is as follows: “When I see someone I know, I: (1) turn and look, (2) smile, (3) say ‘Hi ___,’ (4) say ‘How are you?’” (p. 698). The children with ASD were then instructed to interact in play sessions with typical peers. These peers were educated in ways to interact with children with ASD. For example, peers were given the following strategies to help children with ASD: “combining nonverbal cues with verbal information, ignoring inappropriate comments or repetitive behaviors, and actively suggesting a change in topic during a monologue” (p. 691). This type of social skills training led to improved social skills and increased feelings of social supports.

Explicit instruction social skills interventions. Explicit instruction is a process where “students are guided through the learning process with clear statements about the purpose and rationale for learning the new skill, clear explanations and demonstrations of the instructional target, and supported practice with feedback until the independent mastery has been achieved” (Archer & Hughes, 2011, p. 1). In a study by Kamps et al. (1992), adolescents with ASD were provided with explicit instruction for specific social skills. Training was conducted for individual groups during the first 10 minutes of 20 minute sessions. There were four instructors and social skills explicit instruction lasted

for two to three weeks per skill. The specific skills included in the instruction include, but are not limited to, initiating an interaction, giving and accepting compliments, helping others, and asking for help. Based on this study, improved social performance was noted for target students. Adolescents with ASD increased the frequency in which they displayed social interactions, as well as the amount of time spent in social interactions with others. Target students increased their levels of initiations of social interactions, as well as their responses to social interactions initiated by peers. Based on this study, explicit instruction in the area of social skills training was regarded as a viable method for increasing the frequency and duration of social interactions for children with ASD (Kamps et al., 1992).

Krantz and McClannahan (1993) used explicit instruction via a script fading procedure in order to increase the social interactions of youth with ASD. These children were given a script to initiate an interaction with a peer. Throughout the sessions, the script was faded. After the script was faded completely, the participants' levels of peer interactions were within the same range as neurotypical peers. Tse et al. (2007) also completed a study in which social skills training utilizing explicit instruction was implemented with adolescents with ASD. The social skills curriculum consisted of reviewing previously taught skills, introducing a new skill, practicing the new skill through role-play, and an activity. The book, *SkillStreaming the Adolescent*, was used to create exercises to teach the new skill. The results of this study indicate that explicit instruction in social skills groups can be an effective way of developing and increasing the frequency of social skills in adolescents with ASD (Tse et al., 2007). Based on a review of social skills interventions, evidence suggests that incorporating neurotypical

peers and explicit instruction teaching methods into a structured social skills program will result in positive outcomes for students with ASD.

Use of restricted interests in social skills interventions. Fewer studies have incorporated the use of restricted interests in teaching youth with ASD new skills. According to Bottema-Beutel, Mullins, Harvey, Gustafson, and Carter (2015, p. 7), “learning social skills while doing an activity was considered easier or more enjoyable because it could help maintain focus or provide something to talk about.” Fewer studies demonstrate the importance of using a preferred activity in social skills interventions. According to Koegel and colleagues (2012), using a perseverative interest can improve the frequency of social interactions between youth with ASD and their neurotypical peers. In this study a social club was formed around the perseverative interests of three adolescents with ASD (e.g., movies, comic books, card games). During the baseline phase, none of the three participants were socially engaged with their peers. Once the participants began attending the social clubs their social engagement during the club improved to 100%. In addition to their social engagement improving, all three participants increased their number of social initiations. In neither the baseline, nor the intervention phase, were the participants or their neurotypical peers prompted to engage in social interactions.

In another study, preferred interests were again used in order to improve the socialization of students in a school setting (Koegel et al., 2013). New clubs were formed at school in order to incorporate the restricted interests of seven participants with ASD (e.g., basketball club, movie club, computer graphics club). Again, these students were not prompted to interact with peers in either the baseline or the intervention phase. Again,

adolescents with ASD increased their level of engagement and their frequency of social initiations with their typical peers. Evidence was obtained supporting the effectiveness of social interventions for adolescents with ASD that incorporate the use of preferred interests.

Another study demonstrated the use of restricted interests of youth with ASD in social interventions in order to increase the social behavior of children with ASD. Participants with ASD were taught a game based on a perseverative interest. Data collected throughout the intervention period revealed a significant increase in social interactions. For example, before the intervention one participant socially interacted with his peers an average of 19% of the intervals for seven sessions. During the intervention, this participant averaged 66% of the intervals with appropriate social play interactions (Baker, Koegel, & Koegel, 1998).

The studies reviewed provide evidence that adolescents with ASD can interact appropriately with their peers, increase the frequency of their social interactions with others, and increase their social engagement time with others if their preferred interests are incorporated in the intervention.

The Current Study

The literature on social interventions for adolescents with ASD offers support for including several components in social skills interventions. For example, involvement of typical peers, explicit instruction, and use of perseverative interests have all been shown to be effective components of interventions targeting social skills (Koegel et al., 2012). The purpose of the current study was to determine whether explicit social skills instruction in a restricted interest group in an afterschool club setting increased the

frequency of specific social skills in two students identified with ASD. The specific social skills chosen for this study were asking for help, giving a compliment, and accepting a compliment. Data were collected using a single-subject multiple baseline across behavior research design in order to assess whether these procedures would increase the frequency at which the social skills were displayed in the restricted interest setting.

Method

Participants

Fifteen students participated in a Minecraft Club developed as part of a larger research study. Seven of the participants were typically-developing and eight had an Autism Spectrum Disorder diagnosis. For this thesis, the results of two randomly chosen participants with ASD will be discussed. Two participants, ages 9 and 11 years, participated in this study. These participants were chosen based on their meeting the inclusion criteria: (a) documentation that the student has been identified by a third party professional as having an ASD (a formal diagnostic report or a written attestation by the diagnostician was obtained from a caregiver) and (b) parent report documenting that the participant has played and enjoyed the online game Minecraft (an attestation, written or verbal, was obtained by a caregiver acknowledging that their child s plays and enjoys the game Minecraft; a verbal attestation was also obtained by the participants). Restricted interest was also measured using participant interviews in which the participants recorded themselves as a five (extremely agree) on a Likert-scale questionnaire (range 1-5) on the following questions: (a) I enjoy playing the online game, Minecraft, (b) I wanted to join this club because it was about Minecraft, and (c) I like to talk about Minecraft with friends.

Participants were recruited through a pediatrician that specializes in working with children with ASD. The caregivers of these children were notified of the nature of the study and their children were included if the inclusion criteria were met.

The first participant, Donald, is a 9-year-old Caucasian male in the third grade. He attends public school, is mainstreamed in the general classroom setting, and excels

academically with straight A's. The second participant, Ted, is an 11-year-old Caucasian male in the fifth grade. He attends public school, where he spends the majority of the school day in the resource room, and parent reports that he struggles with academics. He is mainstreamed into the general education setting was for physical education, art, music, and social studies. Ted also receives speech in the school setting.

Materials

The book *SkillStreaming in the Middle School: Lesson Plans and Activities* was used to develop the social skills lessons (McGinnis & Goldstein, 1997). It is a prosocial skills instruction manual that can be used by teachers, counselors, and others.

SkillStreaming relies on the use of direct instruction to develop cognitive behavioral skills in order to enhance overall skill mastery and ability to generalize across settings.

SkillStreaming lessons are organized by objective, task analysis of skill steps, and a listening looking guide (McGinnis & Goldstein, 1997). This intervention uses many empirically based strategies for improving prosocial behavior (e.g., modeling, coaching, behavioral rehearsal, and reinforcement) (Evans & Stefanou, 2009).

Setting

The study occurred once a week for eight weeks from 4:30 – 5:30 p.m. at a university-based computer lab. Computers were set in rows of six computers facing forward with a large screen in front of the room that showed the screen of the Minecraft teacher. Each student was strategically placed at a different computer, surrounded by different peers, each week (adjustments were made appropriately for absent students). Students were placed with peers (both with ASD and neurotypical) that were likely to encourage their use of social skills as well as peers with differing levels of Minecraft

experience. Each week, students would find their name on their corresponding computer. Assistants with video cameras were placed around the room to record the social interactions of the students.

Dependent Variables

The three dependent variables examined were (a) asking for help, (b) giving a compliment, and (c) accepting a compliment. The dependent variables were recorded using a frequency count. Data were collected for two 10-minute sessions each Minecraft club. A research assistant recorded 10-minute sessions during the portion of the club where students play Minecraft. Data were later coded by one or two trained observers via the video recordings of the sessions. During data coded, the videos were played on an iPad and the observers would either code the data independently (for inter-observer agreement) or the data would be coded and analyzed together. *A priori* operational definitions were developed based on the *SkillStreaming* curriculum. These operational definitions were further refined after initial baseline observations of the behaviors exhibited in the Minecraft club setting. These three dependent variables were chosen because they reflect the skill hierarchy identified in the *SkillStreaming* curriculum and they exhibited skills typically observed in an afterschool club setting.

Asking for help was defined as the student getting the attention of at least one person and then requesting help from that person. An example of asking for help would be the participant turning to his peer and getting his/her attention by saying, “Hey, can you show me how to log onto my computer?” It was not scored as *asking for help* if the participant did not first secure peer attention by saying person’s name, tapping person on

the shoulder, or obtaining eye contact. For example, if the participant asked a question while still looking at the computer screen, this was not coded as *asking for help*.

Giving a compliment was defined as a student getting the attention of at least one person and then giving that person positive feedback regarding an achievement or any other characteristic of that peer (e.g., physical appearance or effort). An example of giving a compliment would be a student saying “Good job building that wall” when a peer expresses that they reached a goal in the computer game. It was not scored as *giving a compliment* if the participant did not first secure peer attention by saying person’s name, tapping person on the shoulder, or obtaining eye contact.

Accepting a compliment was defined as the student clearly receiving a compliment from another person, and then responding in a way that positively acknowledges the compliment. The participant was not required to give a physically orienting response in order for his behavior to be coded as *accepting a compliment*. An example of accepting a compliment would be, a peer says to the student “Nice job,” and the student responds with a high five.

Research Design and Procedures

A multiple baseline across behaviors experimental design was employed to assess the effect of the intervention. A multiple baseline across behaviors experimental design refers to a study in which an intervention is applied at different times across different behaviors (Gast, Lloyd, & Ledford, 2014). This research design was appropriate because this study examines the effectiveness of an intervention on three different behaviors (i.e., asking for help, giving a compliment, and accepting a compliment). Data were collected two times per Minecraft club throughout the study. Systematically staggered baselines of

sessions 3, 5, and 7 were recorded for Donald and systematically staggered baselines of sessions 3, 7, and 9 were recorded for Ted. Data were graphed and analyzed visually to assess the effectiveness of the intervention by comparing data within and between participants.

Baseline

During baseline, the social interactions of both participants were observed during the first two sessions of the Minecraft club. The students were instructed on how to play the Minecraft game, and no additional instructions were given, nor were the participants given any prompts to interact with peers. The participants' social interactions were video recorded and later coded by trained observers.

Intervention

Before baseline observations, participants were interviewed to ensure an interest in the game Minecraft. Throughout the entire duration of the social club, each participant's diagnosis was kept confidential. The social club was similar to other afterschool clubs in which students similar in age meet after school to engage in an interesting topic.

Each session, the club had a similar structure. First, participants entered the classroom where computers were not yet turned on. Next, the instructor conducted a social skills lesson using explicit instruction based on a *SkillStreaming* lesson, modified to incorporate Minecraft, for approximately 10-15 minutes. Lessons were modified by adding Minecraft terms and incorporating examples that could potentially be exhibited in the small-group Minecraft club setting. Next, participants were divided into teams or groups and were allowed to play Minecraft for 40-45 minutes. Teams were created by

including both participants with ASD and neurotypical peers. Also, participants with ASD were grouped with peers that encouraged social interaction and peers with differing levels of Minecraft skill. Participants were given tasks and assignments, within the game, each week that promoted working with their group members. Participants were consistently prompted throughout the game to practice the taught, and previously taught, social skills and were given self-monitoring sheets to keep track of their progress. Each sheet had a social goal related to the social skill taught that week (e.g., I will give five compliments today). Finally, approximately five minutes before club ended, participants were instructed to pause their game and the instructor led a group discussion. Each participant was encouraged to share with the group about their performance in regards to the social skill taught that day and their performance in the game. Participants were given extra time to complete the Minecraft task if they met their social goal that day. If participants did not meet their social goal, they were dismissed from the club after group discussion.

Start of the Session

As participants entered the classroom, there would be a video of Minecraft hints and tips playing. Participants would be instructed at the beginning of the club to keep their computers off until further instructions were given. The video was turned on 15 minutes prior to the beginning of club and played until club began. Each club followed a similar structure in regards to time. The first 15 minutes was allotted to social skills explicit instruction. Next, participants were allowed to play Minecraft for 40 – 45 minutes. At the end, 5 minutes would be allotted to a group discussion. Rewarded time (approximately 5 minutes) was given at the end of the group discussion.

Explicit Social Instruction

Once all members had arrived, the members were broken up into two groups and each group was assigned a teacher. Both teachers were a Board Certified Behavior Analyst who had prior experience teaching the *SkillStreaming* curriculum. The teachers would then use the *SkillStreaming* curriculum to guide each member through the steps of acquiring and using social skills appropriately. Each lesson followed a script modified from the *SkillStreaming* curriculum in which each skill was broken down into three to five steps that were explicitly taught and displayed in the front of the classroom and on a self-monitoring sheet given to each member of the club. The teachers then modeled each step of the skill after instruction. Finally, each participant was instructed to role-play examples and non-examples of the skill.

The first social skill taught to the members was *asking for help*. They were then taught how to *give a compliment* and finally how to *accept a compliment*. The teachers would first teach the steps of the skill. The steps of the skill were taken from the *SkillStreaming* curriculum but were modified to incorporate the restricted interest when applicable. These steps were displayed on the front screen and also on a sheet of paper given to each student to use as a reference. For example, when the skill *asking for help* was taught, a task analysis of the steps was printed out for each individual to keep at his/her desk and reviewed by the teacher in front of the room. To incorporate the restricted interest, the task analysis read “Asking for help Minecraft Style” and a picture of a Minecraft related item was at the top of the task analysis. The steps remained the same from the original *SkillStreaming* lesson and were as follows:

1. Decide if you need help

2. Pick who you want to ask
3. Get your friend's attention
4. Ask your question
5. Say "Thank you"

Next, each student was asked to practice the skill in mock sessions. Each participant was asked to model an example of each skill and a non-example. The participants also watched as the other participants modeled the skill and provided feedback to one another. Finally, each student was asked to self-monitor the number of times he engaged in the target behavior. If the student engaged in the target behavior 5 times throughout the duration of the club, he earned five extra minutes of Minecraft club. In this way, the explicit instruction of the social skill followed a teach – model – reinforce hierarchy. In following sessions, students were first given a brief review of previously learned skills and then a new skill would be taught in the same format.

Embedded Social Skills in Minecraft Game

After the social skill was taught, students worked in groups on a Minecraft-related mission for approximately 40 – 45 minutes. These included finding specified objects, building houses, and completing obstacle courses. Participants were placed with partners or in small groups that rotated each session. The Minecraft teacher walked through the groups looking to model or reinforce the social skill and help trouble shoot problems with the game. At points during the game (approximately 2-3 times each session), the Minecraft teacher would pause everyone's game and have them look at their self-monitoring chart. The criteria for each skill differed based on the frequency of the skill being displayed in the club that day. For example, if the participants were struggling to

give a compliment, the Minecraft teacher would pause the game and prompt the participants to review their self-monitoring chart more frequently. She would remind them of the five extra minutes if they met their goal and then would allow students to continue to play.

Interobserver Agreement

Two observers independently recorded data for 42% of Donald's sessions for each dependent measure and 50% of Ted's sessions for each dependent measure. A trained graduate student recorded interobserver agreement (IOA). IOA was collected during both the baseline phase and the intervention phase. IOA was calculated by summing the total number of frequency counts recorded by each observer, dividing the smaller total by the larger total, and multiplying by 100.

Each observer had an identical data collection sheet and would mark her sheet with a tally when a behavior was observed. The average IOA for Donald was 91% with a range of 75% to 100%. The average IOA for Ted was 98% with a range of 80% to 100%.

Results

Donald's data are shown in Figure 1; data collected on the skill *asking for help* are shown in the top panel, data collected on the skill *giving a compliment* are shown in the middle panel, and data collected on the skill *accepting a compliment* are shown in the bottom panel. Based on a visual analysis by two independent observers, Donald's frequency of *asking for help* and *giving a compliment* appeared to increase, but not significantly so. His frequency of *accepting a compliment* appeared to increase for a few sessions, and then decrease again. Based on the visual analysis, a functional relationship between the independent and dependent variables cannot be inferred.

Based on the variability of the data, the average number of times per session Donald used the skills during the baseline and intervention phases were also used to determine the intervention's effectiveness. The amount of times per session Donald *asked for help* increased from the baseline phase ($M = 0.5$ per session) to the intervention phase ($M = 8.9$ per session). The amount of times per session Donald *gave a compliment* increased from the baseline ($M = 0.25$ per session) phase to the intervention phase ($M = 2$ per session). Based on the data analysis, the frequency of Donald *accepting a compliment* also increased from the baseline phase ($M = 0.5$ per session) to the intervention phase ($M = 1.3$ per session).

Figure 2 shows the results for the frequency of social skills demonstrated by Ted. Data collected on the skill *asking for help* are shown in the top panel, data collected on the skill *giving a compliment* are shown in the middle panel, and data collected on the skill *accepting a compliment* are shown in the bottom panel. Based on a visual analysis by two independent observers, Ted's frequency of *asking for help* and *giving a*

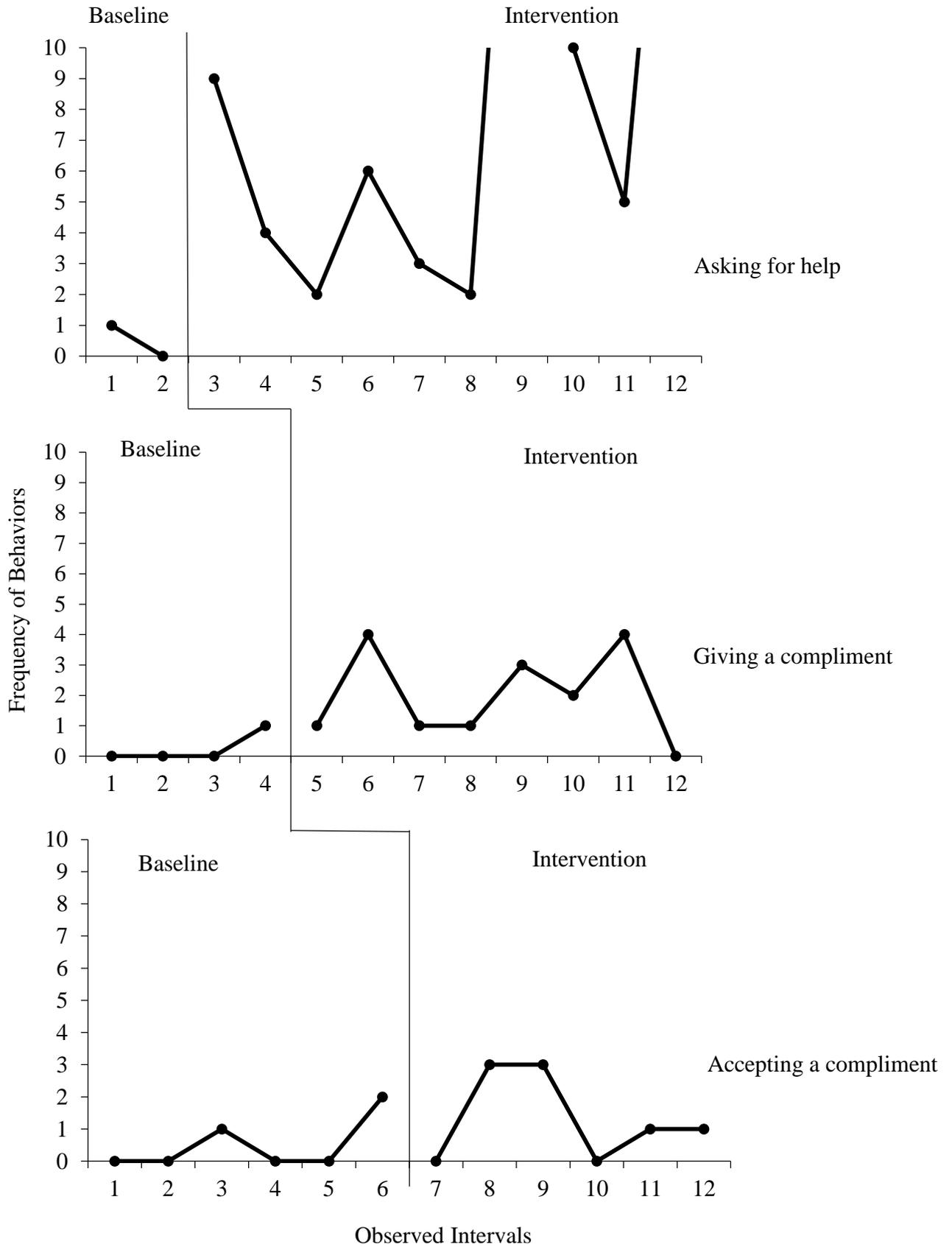


Figure 1. Frequency of specific social skill behaviors displayed by Donald during the baseline and intervention phases.* Lines indicate when the intervention was implemented.

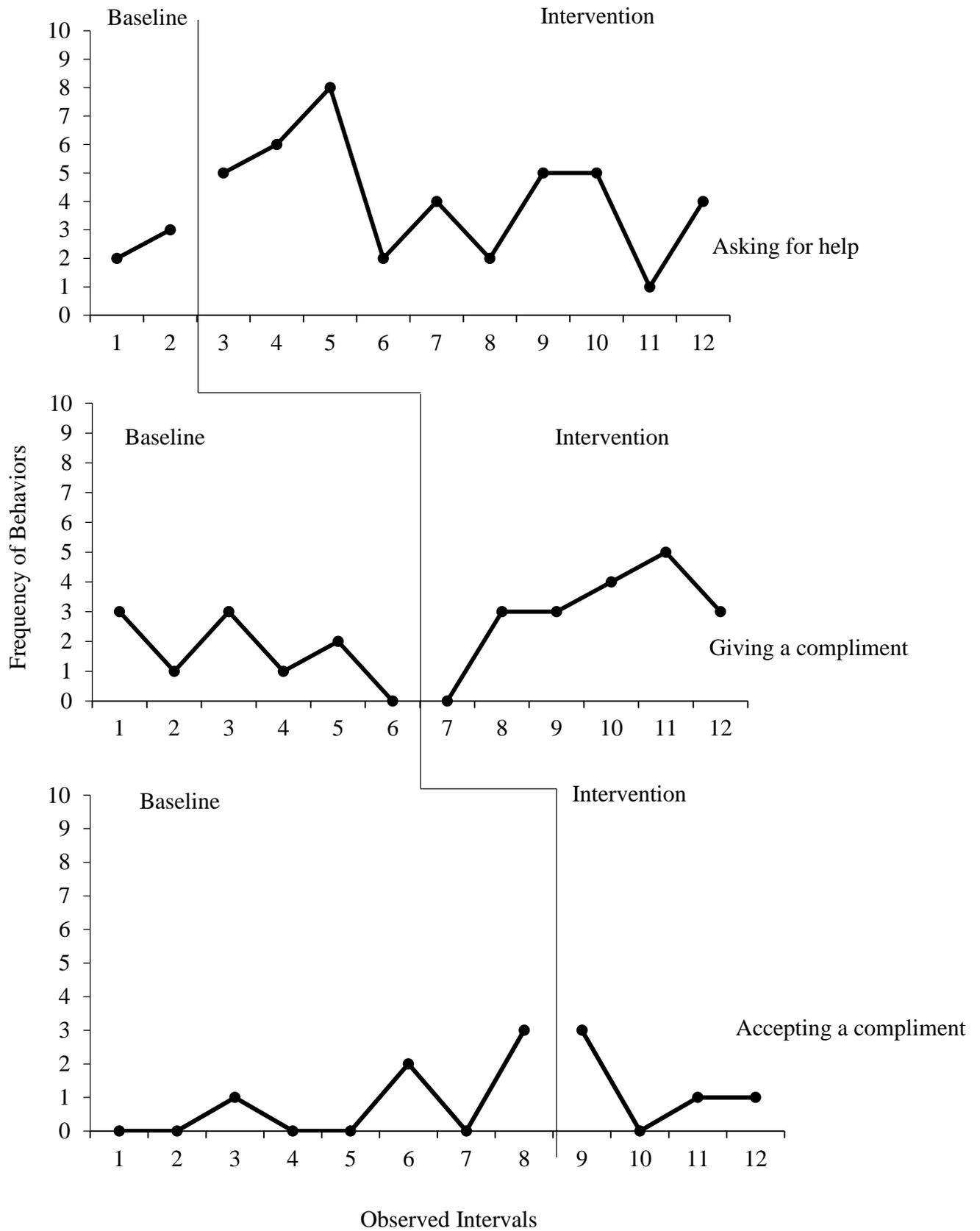


Figure 2. Frequency of specific social skill behaviors displayed by Ted during the baseline and intervention phases.* Lines indicate when the intervention was implemented.

compliment appeared to increase. His frequency of *accepting a compliment* appeared to increase for one session and then decrease back to zero. Based on the visual analysis, a functional relationship between the independent and dependent variables cannot be inferred.

Based on the variability of the data, the average number of times per session Ted used the skills during the baseline and intervention phases were also used to determine the effectiveness of the intervention. The amount of times per session Ted *asked for help* increased from the baseline phase ($M = 2.5$ per session) to the intervention phase ($M = 4.2$ per session). The amount of times per session Ted *gave a compliment* also increased from the baseline ($M = 1.67$ per session) to the intervention phase ($M = 3$ per session). Based on the data analysis, the frequency of Ted *accepting a compliment* stayed relatively the same during the baseline phase ($M = 0.38$ per session) and the intervention phase ($M = .75$ per session).

Discussion

The results of this study demonstrate that both participants positively responded to the intervention by increasing their rate of *asking for help* and *giving a compliment* during the intervention sessions. Increasing the frequency of the use of social skills is a frequently targeted goal for individuals with ASD. The results of this study extend the existing body of research by demonstrating that adolescents with ASD can improve appropriate social behaviors (i.e., *asking for help*, *giving a compliment*) in an inclusive setting with typical peers using a club of perseverative interest and social skills training.

It is interesting to note that although the data were variable and the visual analysis did not appear to demonstrate a functional relation between the independent and the dependent variable, the frequency averages of the skills and the duration of the sessions demonstrate that the results are meaningful for the participants. For example, prior to the intervention, Donald was asking for help an average of once per twenty minutes. After the intervention, he was asking for help an average of 17.8 times per twenty minutes. This is significant to Donald because he was socially engaging another person almost 18 times more often after the intervention.

The frequency of each social skill, for each participant, increased after the intervention was implemented. This means that they were socially engaging others more often after the intervention than prior to the implementation of the intervention. This would mean that Donald and Ted were more social during the club after the intervention, meaning that they were able to participate in the club more effectively and more commensurate with their typical peers. It would be important to note that although the data were variable, it is not uncommon for social skills interventions to produce low

intervention effects (Bellini et al., 2007). Social skills are difficult to improve and this intervention yielded increases in all three social skills measured.

Based on this factor, this could demonstrate the reason behind the lack of a relationship between the intervention and the skill of *accepting a compliment*. In order to accept a compliment, a compliment has to be offered to the student. It could be possible that the participants were not given compliments to accept. Due to the fact that this was the only skill contingent on the actions of others, this could be the reason that there was not a relationship between the independent variable and this dependent variable. Another factor to take into consideration is the amount of opportunity given to display this skill. Since this was the last skill taught, participants were given less opportunity to display *accepting a compliment* as opposed to the other two skills.

It may also be important to note that while there was not a functional relation demonstrated between the intervention and all three social skills; Donald was displaying near 0 on all three skills during the initial baseline sessions and he increased the frequency of use in all three skills. For researchers used to seeing high rates of behavior, these may not look like meaningful differences; however, it would be meaningful for Donald. There were also some high outliers in Donald's data that would be relevant to discuss. There were two sessions in which Donald asked for help a high number of times and this might raise questions of a new problem of overgeneralizing asking for help. However, there were only two extreme data points out of the twelve sessions and this could be explained by the topic of the club those sessions. He may not have known as much about the topics these days, and he needed extra help to complete his tasks.

There were several other limitations noted in this study. The first would be the method used to collect the data. Data were only collected for two 10-minute sessions each one hour Minecraft club. Due to the fact that data were not collected throughout the entire duration of the club, participants could be engaging in targeted social interactions when not being observed. Also, participants were only given approximately 15 minutes of social skills instruction each club. This raises the question of whether or not the explicit instruction is the sole reason of the increases demonstrated during the intervention phase. Also, typically developing peers were not researched. It would be important to know if neurotypical peers increased their frequency of social interactions as well. Finally, the lack of fidelity checks is another limitation noted in this study. However, the *SkillStreaming* curriculum was explicitly followed.

This study relates to other studies involving social skills instruction in that it incorporated the factors of peers, explicit instruction, and perseverative interests. There is evidence supporting the use of all of these factors to assist in the improvement of social skills in adolescents with ASD. This study incorporated neurotypical peers in the club. Peers were used to model and prompt appropriate social interactions. Explicit instruction was also used. The *SkillStreaming* curriculum was used in order to review a previous skill, teach a new skill, and practice the new skill. There was also a perseverative interest in the topic of the club, Minecraft.

Future Research

Although the results of this study demonstrated an increase in social skills during the club, future research should focus on the generalizability of social skills in settings that are not a restricted interest club. Since data were only collected during the confines

of the club, it is not possible to know whether or not students are generalizing the skills they are learning to other settings and situations without further research. Future research should focus on the frequency of instructed social skills being displayed in settings outside of the club, such as school and home.

It would also be beneficial for future researchers to focus on other social skills deficits typically seen in adolescents with ASD. Pragmatic language is an area in which people with ASD struggle. Basic rules of conversation (e.g., turn-taking) would be an important topic for future researchers to target. Other social skill areas that would benefit from instruction include taking another person's perspective, maintaining topics in a conversation, including relevant details, and using appropriate references in a conversation.

Conclusion

Overall, by incorporating explicit social skills instruction into a restricted interest club, immediate improvements in using social skills more frequently occurred. The participants are now engaging in more appropriate levels of these social behaviors. Research on social interventions to improve the social skills of adolescents with ASD is lacking, and future research is needed to expand upon the existing body of research.

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