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Using Perseverative Interests to Improve Interactions Between Adolescents with Autism and their Typical Peers in School Settings

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Abstract

The literature suggests that adolescents with ASD typically are not socially engaged during unstructured school activities and do not initiate social activities with typically developing peers. This study assessed whether implementing socialization opportunities in the form of lunch clubs based around aspects of the adolescents with ASD's perseverative interests would promote positive direct and generalized social interaction between the target adolescent and their typically developing peers. A repeated measures multiple baseline experimental design (with two reversals) was implemented across participants. During baseline measures, the participants did not show social engagement or initiations. During intervention, results showed large increases in both social engagement and initiations. Generalization measures also showed that the target adolescents improved their social engagements and initiations with typically developing peers throughout unstructured lunchtime activities. These results have implications for understanding variables related to social development in autism.

Keywords

Autism; Adolescents; Initiations; Engagement; Peers; Socialization

A defining characteristic of Autism Spectrum Disorder (ASD) is atypical development in socialization (CDC, 2009). In particular, research has documented that adolescents with ASD have difficulty socially interacting with peers including limited responsiveness, limited or nonexistent initiations, reduced conversational reciprocity, and an overall difficulty sustaining social engagement (DiSalvo, & Oswald, 2002; Moxon, & Gates, 2001). Unfortunately, very little research has been published relating to systematic procedures for improving socialization among this age group (Reichow, & Volkmar, 2010). For this reason, research on the efficacy of successful social interventions with adolescents with ASD becomes especially important when considering the growing number of children approaching this age range, and the risk factors of developing co-morbid disabilities as a direct consequence of difficulty with peer interaction (Farrugia, & Hudson, 2006; Stewart, Barnard, Pearson, Hasan, & O'Brien, 2006).

In particular, adolescents with ASD have fewer lasting peer relationships and spend less time in peer interactions compared to typically developing peers (Bauminger, & Shulman, 2003). This lack of socialization is correlated with the fact that adolescents with ASD are at higher risks for developing depressive symptoms (Kim, Szatmari, Bryson, Streiner, & Wilson, 2000) and social anxiety (Gillott, Furniss, & Walter, 2001). As well, they report to be lonelier than their typical peers (Lasgaard, Nielsen, Eriksen, & Goossens, 2010). In order to ameliorate the possible co-morbid risk factors faced by adolescents with ASD, it is

essential to develop effective interventions that will assist them with socialization and ultimately friendship development with their typical peers (Simpson, 2004).

Although the literature has documented a variety of effective social intervention strategies, most of these models have focused on preschool or elementary school age children with ASD (Koegel, Vernon, Koegel, Koegel, & Paullin, in press; Reichow, & Volkmar, 2010). There are relatively few effective intervention models or programs aimed at ameliorating social deficits experienced by adolescents with ASD, particularly in their inclusive school settings (Bellini, Peters, Benner, & Hopf, 2007; White, Keonig, & Scahill, 2007).

However, the literature on social interventions for young children offers some direction for practitioners and researchers (Reichow, & Volkmar, 2010; Rogers, 2000). For example, structured and predictable environments (Klin, Volkmar, Sparrow, 2000) and involvement of typical peers (Smith, Lovaas, & Lovaas, 2002; Rogers, 2000) have been shown to be effective components of social interventions. Furthermore, Baker, Koegel, Koegel (1998) showed that incorporating highly-preferred perseverative interests as the theme of a social activity resulted in improving the participation of elementary school individuals with ASD in social activities with their typically-developing classmates during lunchtime.

Therefore, the purpose of this study was to systematically assess the effectiveness of structured lunchtime clubs that were based on the perseverative interests of adolescents with ASD. Data were collected to assess whether these procedures would increase the positive social interactions between adolescents with ASD and their typically developing peers.

Methods

Participants

Three participants, between the ages of 11–14 years, participated in this study. All were diagnosed with ASD by an independent state agency with expertise in the differential diagnosis of autism. In addition and staff in our center verified the diagnosis according to the DSM-IV criteria. Participants were identified either by their teachers or counselors as being verbal and conversational, but socially isolated in their school setting.

Participant 1 was a 13 year-old male in the eighth grade. He attended public school and was fully included in all of his classes, and excelled academically. Prior to intervention, his middle school teachers and counselors expressed their concerns about his social behavior. Specifically, he sat by himself throughout every lunch period and never initiated conversation with peers. Furthermore, he made comments to his teachers and adults about feelings of loneliness at school and a desire for meaningful friendships.

Participant 2 was an 11 years old male and in the 6^{th} grade. He was fully included in a regular education class at the local elementary school. After graduating from elementary school, Participant 2 began the fall semester of 7^{th} grade at a local private middle school, and then transferred into a local public middle school for the second semester. Academically, he received Bs and Cs and had some pullout resource services for math. Socially, Participant 2 engaged in some limited conversation with adults but did not initiate or engage in interactions with his peers. Participant 2 was socially isolated, regularly went to the library, and remained by himself.

Participant 3 was a 14 years old male in the 8^{th} grade. He was mainstreamed at a local public school several subjects, but also attended special education classes and with support he achieved Bs and Cs in his academic courses. During baseline, Participant 3 reported serious depression. He engaged in conversation with adults inconsistently and rarely interacted with

peers. Participant 3 spent his lunch periods alone, engaging in repetitive ritualistic behaviors that included hand flapping, putting his elbow above his head and pulling them down, and making inappropriate verbal noises (i.e., "arggghhhh").

Design and Procedures

A repeated measures multiple baseline across participants experimental design (with two reversals for participant 2) was employed (Barlow, & Hersen, 1984) to assess the effect of the intervention. Probes were collected one to two times per week throughout the study. Systematically staggered baselines of 5, 7, and 9 probes were recorded.

Baseline

During the baseline phase, adolescents participated in their regular lunchtime activities. No changes were made in their lunchtime environment, and no additional instructions were given to the adolescents. A large variety of ongoing school clubs were available to students at lunch, as a regular part of the schools' extracurricular activities. The ongoing school clubs varied greatly and included sports activities, arts and crafts, and academic activities. In regard to the actual organization of the ongoing clubs, they had similar components to the clubs developed for intervention, such as encouraging the students to join the clubs through announcements and notes sent home to parents, and providing the students with the opportunity to choose partners and team names after they joined the clubs, if they desired. In addition, most clubs provided snacks or pizza to the members.

Intervention

For each participant with ASD a social club was formed around their perseverative interest. Similar to the ongoing school clubs available to students in baseline, each activity was presented through announcements and printed materials (i.e., flyers) as a club available for all students to attend. Similar to the other social clubs, prior to each club meeting, students were encouraged to choose partners and choose team names if they desired. At no point in time during the social club was the adolescent's diagnosis disclosed to any of the participating peers nor were peers informed that the club was developed around the target adolescent's interests. In addition, similar to the clubs already available to the students at the school, snacks and refreshments (e.g., pizza, cookies) were available for the members. Specific information related to the students' individual clubs are described below.

Participant 1 had a perseverative interest in movies. Therefore, a Movie Trivia Club was developed. An adult downloaded movie trivia questions from the Internet every week and the club facilitator asked the questions in a manner similar to the television show *Jeopardy*. Students were paired into teams of 2 to 4 students, and the club facilitator read each trivia question while teams were given 10 seconds to discuss the correct answer with their partner and provide a response. The first team that scored 7 points won the prize of the day (e.g., a candy bar). Before the club ended, club members voted on a movie title for the following week.

For participant 2 a social club was formed around several of his perseverative interests, which included comic books, cartooning, and card games. Thus a "comic book and gaming club" was organized. For the drawing aspect, cartooning and how-to drawing guides were provided for the club members to learn drawing techniques. The gaming aspect of the club was incorporated with drawing. Each week, a drawing themed game was created. For example, a student would start a picture and pass it around the club where other students would add to the original picture. In the end all club members would have to discuss the image and the pictures always ended up being silly.

Participant 3 had a perseverative interest in card games, and therefore a "Card Game" club was formed. Similar to the other clubs, the rules of the specific card game were explained to all members before the club began. Card games included age-appropriate games, such as Uno, Bingo, and Go Fish.

Dependent Measures

Throughout the study, data were collected on two dependent measures: the percent of intervals that the students with ASD engaged with their typically-developing peers; and the rate of initiations by the students with ASD toward their typically-developing peers. Data were unobtrusively collected either by scoring videotapes of the club or by BA level observers that were frequently in the school environment. These observers had experience with adolescents with ASD and data collection.

Percent interval of engagement was recorded using a one-minute interval recording. For each interval, the presence or absence of engagement was recorded with a plus or minus, and the percent of intervals with presence of engagement was calculated for each session. Engagement was defined as using appropriate pragmatic behavior in the context of the club activity. Thus, appropriate engagement was defined as the target adolescent's ongoing appropriate use of at least 3 of the following: facing peers, making eye contact, gesturing (e.g., pointing), responding to questions, asking questions, making comments, smiling, nodding, and/or sharing of activities or materials with peers during the interval. The absence of appropriate engagement was defined as: periods when the target adolescent was not involved in the activity, was not facing peers or making eye contact, did not respond to questions, did not answer questions or verbalize in any way with the typically-developing peers, and did not smile, nod, share activities or materials, or non-verbally interact with peers.

Rate of initiations was measured as the number of independent spontaneous verbal social communicative behaviors each target adolescent directed toward another peer without being prompted to do so. Initiations included requests, questions, or comments that were not taught to the adolescents during the time frame of the study, and were not preceded by a prompt or instruction to speak. A frequency count was used to record rate of initiations for each session. The total number of initiations the target adolescent made to a typically developing peer(s) was tallied at the end of each club session, and the total was divided by the duration of the club session for that day.

Reliability

Two observers independently recorded data for 20% of the sessions for each dependent measure for each target adolescent in all conditions. Inter-rater reliability was calculated by dividing the total number of agreements by the total number of disagreements plus agreements.

Agreements for percent intervals engaged were defined as the observers recording identical marks (i.e., plus or minus) for each one-minute interval throughout the session. Disagreements were defined as the observers having a different recorded response for each one-minute interval. The average percent agreement for percent intervals engaged was 89% with a range of 75% to 100%.

Agreements for rate of initiation were defined as the observers recording the same number of initiations for a specific session. Disagreements were defined as the observers recording a different number of initiations for any specific session. The average percent agreement for recording rate of initiations was 88% with a range of 66% to 100% (with only one very short session at 66%).

Results

As can be seen in Figure 1, all three participants were socially isolated during the baseline, with zero or near zero percent of the intervals with engagement for every session, with no improving trend over time. This is in spite of the fact that numerous clubs were available for them to attend during baseline. In contrast, all participants improved with intervention when all variables remained the same except for the individualized theme of the club that incorporated the students' perseverative interests.

Specifically, Participant 1 showed no engagement with peers during any of the baseline sessions. During intervention, however, his level of engagement increased immediately, and remained at 100% throughout the condition.

Similarly, Participant 2 did not engage with any peers whatsoever during the baseline data that were collected at his elementary school. Once intervention was implemented, his engagement level gradually improved, reaching and remaining at 100% by the end of the condition. Participant 2 then graduated to middle school, creating a return to the baseline condition, and his percent of intervals with engagement with peers dropped to near zero levels. When the intervention was implemented at the middle school, he rapidly increased his percent of intervals of engagement with typically developing peers to 100%. At that point, this participant transferred to another middle school. Again, his percent of intervals with engagement decreased and continued falling throughout this third baseline condition. While his level of engagement was low, it did not reach zero, indicating some possible generalization from his previous interventions. However, when intervention was again implemented, he engaged with his peers an average of 80 percent of the time.

Participant 3 also showed near zero percent engagement (average of 3%) during the baseline period. In contrast, during intervention, his engagement increased steadily, eventually reaching 100% by the end of the condition.

Figure 2 shows the results for initiations. As can be seen, all three participants did not initiate with their peers during the baseline period. In contrast, all three participants increased their number of initiations following the start of intervention. Participant 1's initiations increased from zero throughout the baseline sessions to an average of 16 initiations per session during the intervention condition.

Participant 2 made no initiations during baseline at his first school. Once intervention was implemented, his rate of initiations increased to an average of 6.33 per session. Participant 2 then graduated to middle school with a return to baseline conditions, and his rate of initiations dropped to near zero averaging 0.25. When intervention was again implemented, he again increased his rate of initiations, averaging 10 per session. At his third school, Participant 2 averaged 2.57 initiations during baseline, which although low indicated some possible generalization from his previous interventions. During the final intervention condition, he averaged 11.3 initiations per session.

Participant 3 also demonstrated no initiations during baseline. During the intervention phase he improved, averaging 2.6 initiations per session.

Discussion

The results of this study contribute to the existing literature in several interrelated ways. First, the results of our study clearly demonstrate that adolescents with ASD can appropriately engage and initiate in social environments with their typically-developing peers. As documented, all three participants positively responded to intervention not only by

increasing their percent of intervals engaged with their typically-developing peers but also by increasing their rate of initiations during the sessions. Engagement and initiations are frequently targeted goals for individuals with ASD and are considered prognostic indicators of long-term favorable outcomes (Koegel, Koegel, Shoshan, & McNerney, 1999). Moreover, these results are especially important because, to date, there are relatively few studies documenting effective naturalistic social interventions focused on this older age group (Bellini et al., 2007). As mentioned above, the majority of social interventions for individuals with ASD have been conducted with young children (e.g., elementary school-age) (Koegel et al., in press). The results of this study extend the existing body of research by demonstrating that adolescents with ASD in middle school can rapidly improve appropriate social behaviors (i.e., engagement, initiations) in inclusive school settings with typical peers using a relatively simple intervention model.

Secondly, the current study corroborates previous research findings related to using perseverative and/or ritualistic interests (Baker, 2000), as well as, peer-mediated interventions to improve social behaviors in adolescents with ASD (Chan, Lang, Rispoli, O'Reilly, Sigafoos, & Cole, 2009). Specifically, we found that providing a structured club that incorporated themes of activities around the adolescents' perseverative interests helped increase initiations and engagement with typically developing peers. Baker, et al.(1998), also found similar results when they developed playground games and activities during recess and lunch based around elementary school-aged children with ASD's preferred interests. Further, the present study supports the findings of Hillier, Fish, Cloppert and Beversdorf (2007) in which they found that youth clubs for adolescents with ASD helped foster positive social interactions with other students. As a whole, these studies suggest that specially designed individualized activities can be very important in helping adolescents with ASD develop social relationships with typically developing peers.

It is also interesting to note that some of the procedure employed in this intervention relate to key components of Pivotal Response Treatment as they relate to motivation. For example, variables such as incorporating highly preferred activities (Koegel, Dyer, & Bell, 1987), priming or prior experience with activities (Gengoux, 2009; Koegel, Koegel, Frea, Green-Hopkins, 2003; Zanolli, Daggett, & Adams, 1996), and using natural and direct reinforcers (Koegel, Koegel, Harrower, & Carter, 1999) may also be important in motivating adolescents with ASD. These components, used in combination, have been shown to produce particularly large effects, for improving social communication and socialization and these variables have been shown to encourage participation, engagement, and generalization to other settings (Koegel, & Koegel, 2006).

It may also be important to note that while there was an adult facilitator at these clubs, the clubs were mostly mediated by peers (i.e., students did most of the talking, directing of the club activities). This may be especially important, as research has shown that peer-mediated interventions promote positive development of friendships and also have the greatest potential to exhibit generalization outside of the clubs (Chan et al., 2009; Christopher, Nangle & Hansen, 1993). Anecdotally, participant 1 had never been invited to hang out with a typically developing peer nor had he received a birthday invitation from a peer until he participated in the club designed around his perseverative interest (i.e., Movie Trivia Club). However, during the course of this study, he received multiple invitations to hang out and invitations to birthday parties from typically developing peers who also participated in the same club. The fact that the lunch clubs were peer-mediated may have facilitated the formation of friendships for participant 1, leading to these peer interactions outside of school. Similarly, participant 2 may have also benefited from the clubs being peer-mediated as reflected by his generalization of social behaviors to his second and third school.

Although research suggests that children and adolescents with ASD have a difficult time developing and maintaining friendships (Knott, Dunlop, & Mackay, 2006; Attwood, 2000), these individuals appear to yearn for such relationships with peers (Kasari, & Rotheram-Fuller, in press). This study demonstrated that creating a club centered on the adolescent's perseverative interest provided a common ground upon which significantly improved social interactions (between adolescents with ASD and typically developing students) could be formed (Feld, 1982; Cohen, 1977). From a theoretical point of view, these idiosyncratic interests may be powerful positive reinforcers for adolescents with ASD and provide them with a context to engage appropriately with peers (Charlop, Kurtz, & Casey, 1990; Wolery, Kirk, & Gast, 1985). Furthermore, the results of this study also demonstrated that once intervention began, the participants were able to quickly stay engaged with peers and make spontaneous and unprompted initiations. Similar studies that studied effective social clubs in the school environment have found parallel effects where once intervention began, the participants showed a sudden increase in appropriate social interactions with typically developing peers (Koegel et al., in press; Baker et al., 1998).

Overall, it may be important to note that this study focused on an age group that is often teased, bullied, and socially isolated (Lasgard, et al., 2010; Knott, et al., 2006; Bauminger, & Shulman, 2003) and that the intervention was altered only slightly from ongoing extracurricular activities that were previously occurring at the schools. However, by incorporating the individualized interest of the adolescent with ASD, immediate improvements in socialization occurred. Social interventions for adolescents are greatly lacking in the literature, and future research addressing interventions that improve the socialization of adolescents and the generalized effects of these interventions is most certainly needed and likely to be productive.

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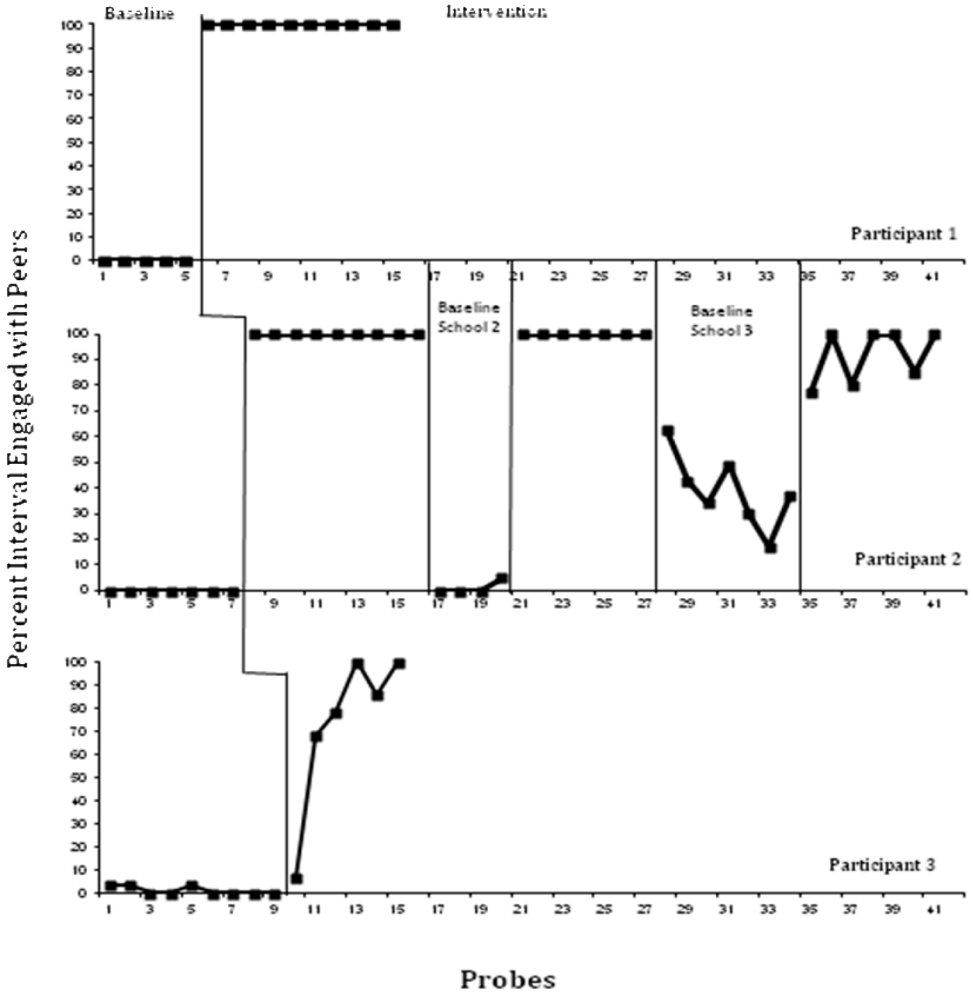

Figure 1.
Target participants' percent of intervals engaged with typically developing peers.

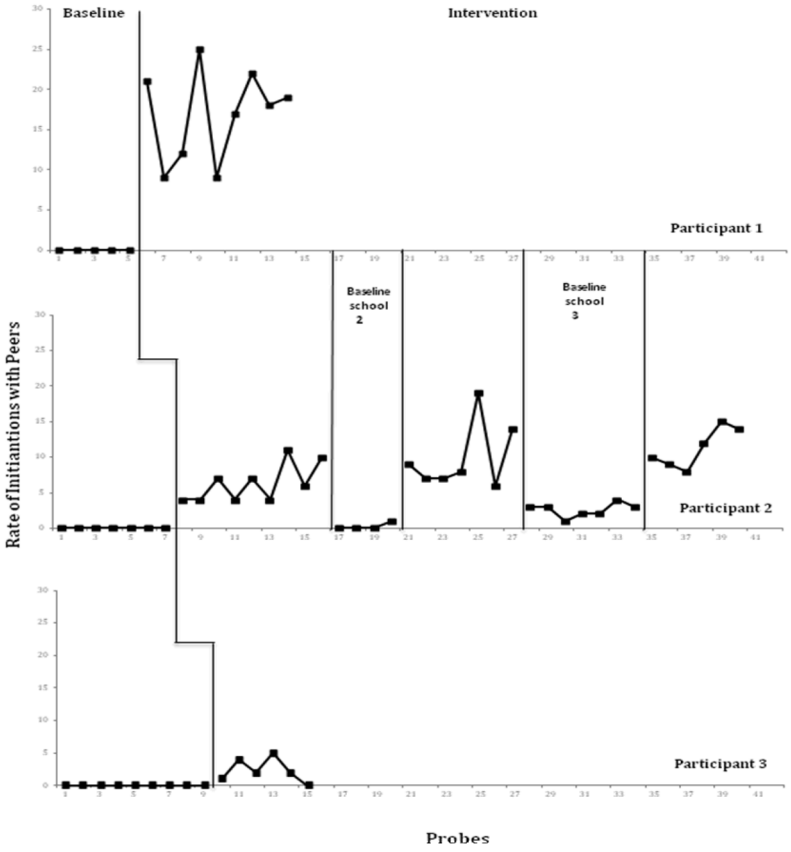

Figure 2.
Target participants' rate of initiations with typically developing peers.