

Using Perseverative Interests to Improve Interactions Between Adolescents With Autism and Their Typical Peers in School Settings

Robert L. Koegel, Rosy Fredeen, Sunny Kim, John Danial, Derek Rubinstein and Lynn Koegel

Journal of Positive Behavior Interventions published online 16 March 2012

DOI: 10.1177/1098300712437043

The online version of this article can be found at:

<http://pbi.sagepub.com/content/early/2012/03/14/1098300712437043>

A more recent version of this article was published on - Jun 5, 2012

Published by:

Hammill Institute on Disabilities



and



<http://www.sagepublications.com>

Additional services and information for *Journal of Positive Behavior Interventions* can be found at:

Email Alerts: <http://pbi.sagepub.com/cgi/alerts>

Subscriptions: <http://pbi.sagepub.com/subscriptions>

Reprints: <http://www.sagepub.com/journalsReprints.nav>

Permissions: <http://www.sagepub.com/journalsPermissions.nav>

Version of Record - Jun 5, 2012

>> OnlineFirst Version of Record - Mar 16, 2012

What is This?

Using Perseverative Interests to Improve Interactions Between Adolescents With Autism and Their Typical Peers in School Settings

Robert L. Koegel, PhD¹, Rosy Fredeen, PhD¹, Sunny Kim, BA¹, John Danial, BA¹, Derek Rubinstein, BA¹, and Lynn Koegel, PhD¹

Abstract

The literature suggests that adolescents with Autism Spectrum Disorders (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 and direct 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. 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 (Centers for Disease Control and Prevention, 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 comorbid 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 risk

for developing depressive symptoms (Kim, Szatmari, Bryson, Streiner, & Wilson, 2000) and developing high levels of social anxiety (Gillott, Furniss, & Walter, 2001; Sze & Wood, 2007; Wood & Gadow, 2010). As well, they report to be lonelier than their typical peers (Lasgaard, Nielsen, Eriksen, & Goossens, 2010). To ameliorate the possible comorbid 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

¹University of California Santa Barbara, Santa Barbara, CA, USA

Corresponding Author:

Robert L. Koegel, University of California-Santa Barbara, Autism Research Center, Santa Barbara, CA 93106-9490, USA
Email: Koegel@education.ucsb.edu

Action Editor: V. Mark Durand

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 (Rogers, 2000; Smith, Lovaas, & Lovaas, 2002) have been shown to be effective components of social interventions. Furthermore, Baker, Koegel, and 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 and 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, staff in our center verified the diagnosis according to the *Diagnostic and Statistical Manual of Mental Disorders—Fourth Edition, text revision (DSM-IV-TR; American Psychiatric Association, 2000)* 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 boy in the eighth grade. He attended public school and was fully included in all of his classes, and excelled academically. Prior to intervention, his junior high 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-year-old boy in the sixth 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 seventh grade at a local private junior high school and then transferred into a local public junior high 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-year-old male in the eighth grade. He was mainstreamed at a local public school in 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”).

Settings

The study primarily took place at local junior and senior high schools in and around Santa Barbara. For Participant 1, the study took place at a local junior high school. For Participant 2, the study took place at a local elementary school and when the participant graduated from the school, the study took place at a local junior high school and he then transferred to another local high school. For Participant 3, he attended a nearby junior high school. At the school sites, we implemented the structured socialization opportunities (SSOs) either in a classroom or in the courtyard during lunchtime. The study also took place at a laboratory at the University of California, Santa Barbara, for detailed data analysis.

Dependent Measures

Throughout the study, data were collected on two dependent measures: the percentage of intervals that the students with ASD engaged with their typically developing peers and the frequency 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. When data were recorded in vivo, observers recorded the dependent measures at the participating schools. The observers were integrated unobtrusively in the school environment and introduced as student teachers, which is a common practice in the school system. When data were recorded by video, observers recorded the dependent measures at the laboratory in real time. Approximately half of the sessions were recorded in vivo and the other half were recorded by video, with the decision based on the ease of unobtrusively integrating the recording procedure into the ongoing activity.

Percentage partial interval of engagement was recorded using a 1-min interval recording. For each interval, the

presence or absence of engagement was recorded with a plus or minus, and the percentage 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 three 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 follows: 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 nonverbally interact with peers.

Frequency 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 frequency 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.

Interobserver Agreement

Two observers independently recorded data for approximately 20% of the sessions for each dependent measure for each target adolescent in all conditions. Interobserver reliability was calculated by dividing the total number of agreements by the total number of disagreements plus agreements. Interobserver agreement was collected either by in vivo or by analyzing a video in the laboratory. As noted in the measurement section, data were recorded in vivo, that is, two observers independently recorded the dependent measures at the participating schools. When data were recorded by video, two observers independently recorded the dependent measures at the laboratory.

Agreements for percentage intervals engaged were defined as the observers recording identical marks (i.e., plus or minus) for each 1-min interval throughout the session. Disagreements were defined as the observers having a different recorded response for each 1-min interval. The average percentage agreement for percentage intervals engaged was 89%, with a range of 75% to 100%.

Agreements for frequency 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 percentage agreement for recording frequency of initiations was 88%, with a range of 66% to 100% (with only one very short session at 66%).

Research Design

A repeated measures multiple-baseline across-participants experimental design (with two reversals for Participant 2) was used (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 five, seven, and nine probes were recorded.

Procedures

Throughout both the baseline and intervention, students could join any of the large variety of ongoing clubs on campus. In addition, club participants had opportunities to choose partners and team names according to already existing protocols in place at the schools.

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.

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, before 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. As in the baseline condition, the students were never prompted to initiate or engage with their typical peers, and the participants and their typically developing peers always chose to participate willingly with the exception that Participant 1 forgot to attend one of the club meetings and data were not recorded for that session. 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.

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.

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 junior high school, creating a return to the baseline condition, and his percentage of intervals with engagement with peers dropped to near zero levels. When the intervention was implemented at the junior high school,

he rapidly increased his percentage of intervals of engagement with typically developing peers to 100%. At that point, this participant transferred to another junior high school because of parental feeling that the academic setting in the subsequent school was better. Again, his percentage of intervals with engagement decreased and continued falling throughout this third baseline condition. Although his level of engagement was low, it did not reach zero at the third school. When intervention was again implemented, he engaged with his peers an average of 80% 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 frequency of initiations increased to an average of 6.33 per session. Participant 2 then graduated to junior high school with a return to baseline conditions, and his frequency of initiations dropped to near zero averaging 0.25. When intervention was again implemented, he again increased his frequency of initiations, averaging 10 per session. At his third school, Participant 2 averaged 2.57 initiations during baseline. 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. Although Participant 3 improved overall, his improvements in initiating to typical peers were small increases and began to decrease after the fourth session and reached near zero by the sixth session (the asterisk in Figure 2 indicates that medication was prescribed during these sessions and it is possible that the medications may have influenced the results).

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 percentage 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

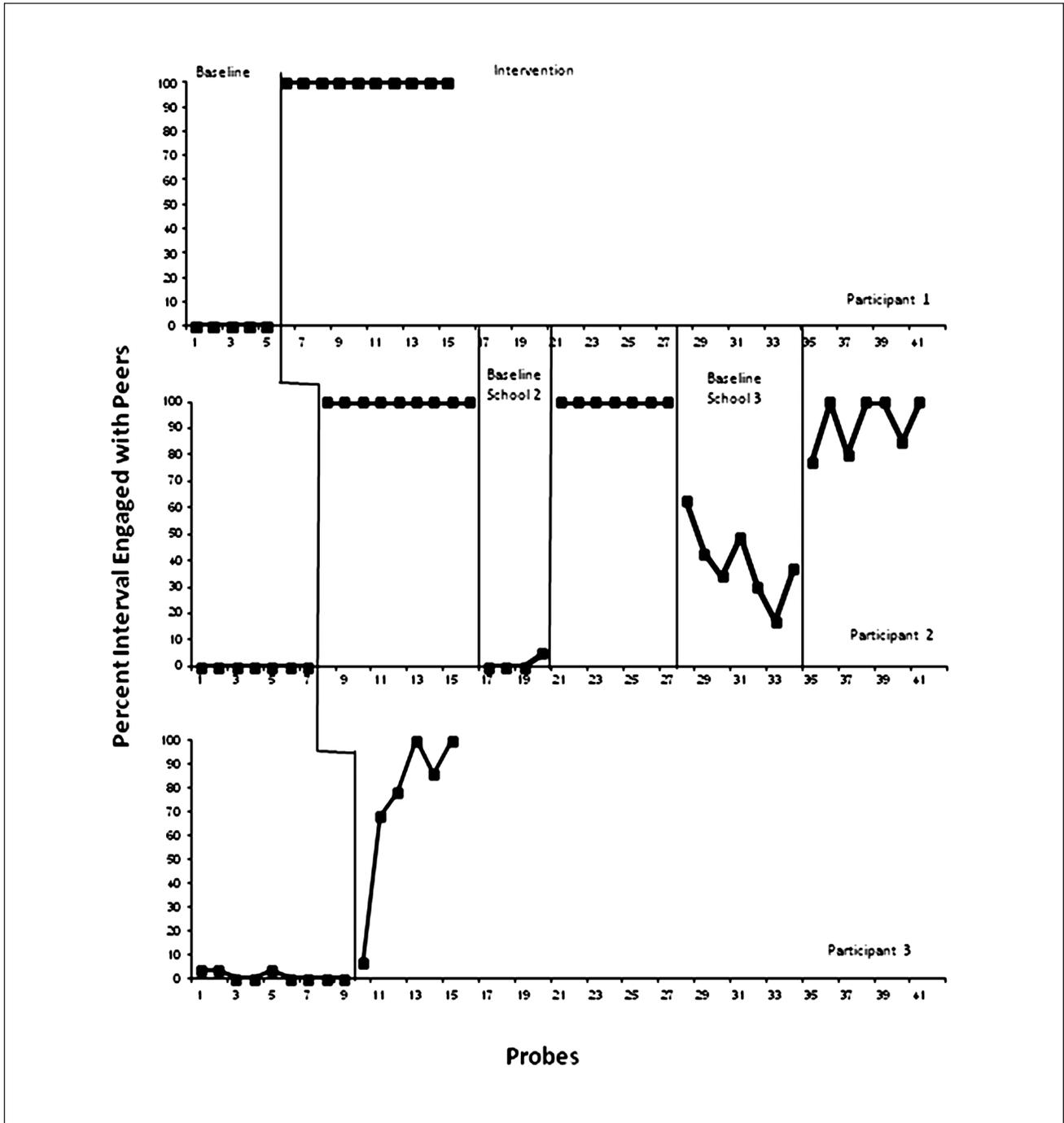


Figure 1. Target participants' percentage of intervals engaged with typically developing peers.

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 junior high school can rapidly improve appropriate social behaviors (i.e., engagement, initiations) in inclusive school settings with typical peers using a relatively simple intervention model.

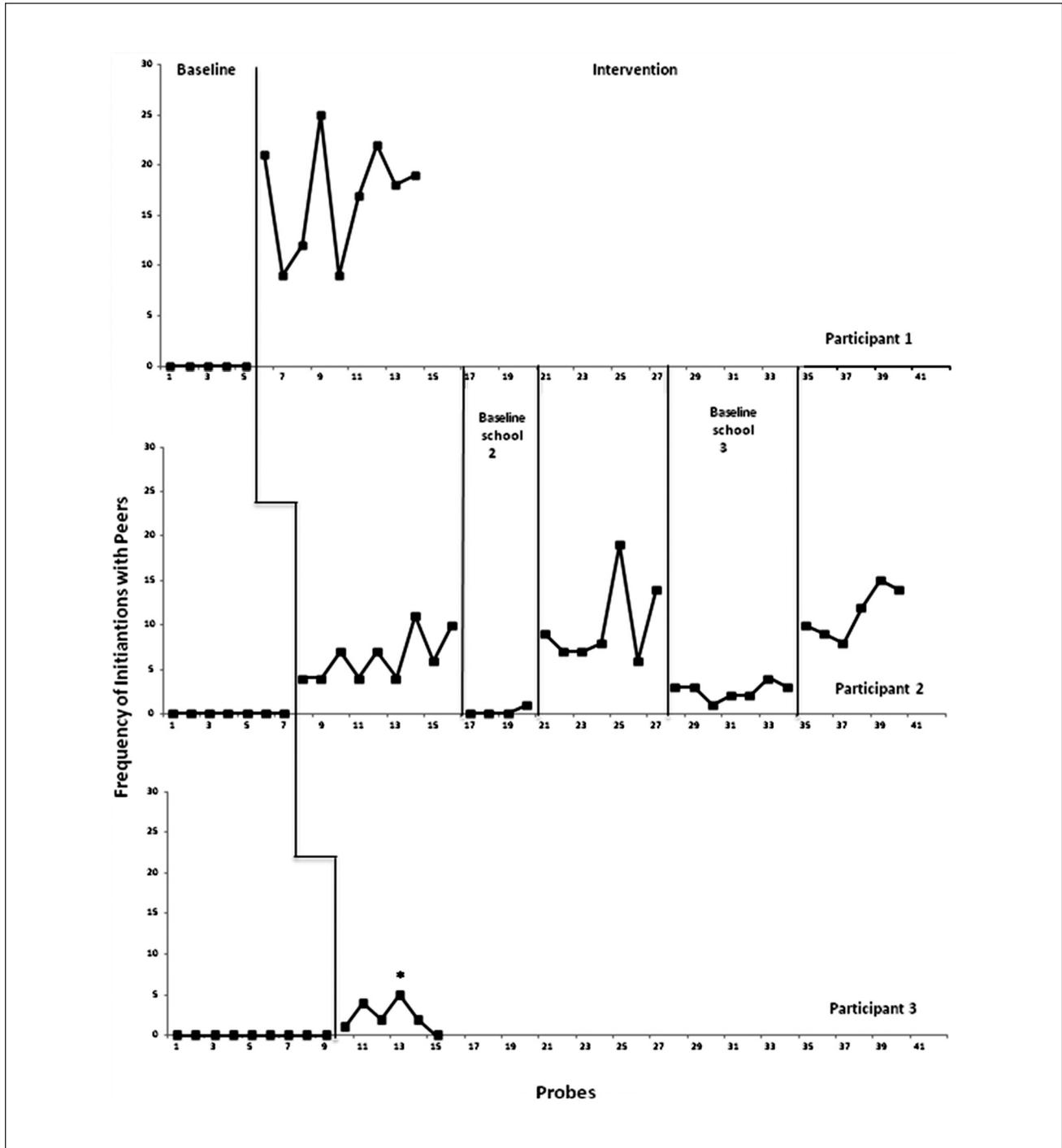


Figure 2. Target participants’ frequency of initiations with typically developing peers. Note. The asterisk (*) indicates that Participant 3 began taking medication at this point.

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 et al., 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 the

preferred interests of elementary school-aged children with ASD. 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 procedures used 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, as well as 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 schools.

Although research suggests that children and adolescents with ASD have a difficult time developing and maintaining friendships (Attwood, 2000; Knott, Dunlop, & Mackay, 2006), 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 on which significantly improved social interactions (between adolescents with ASD and typically developing students) could be formed (Cohen, 1977; Feld,

1982). 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 (Baker et al., 1998; Koegel et al., in press).

Overall, it may be important to note that this study focused on an age group that is often teased, bullied, and socially isolated (Bauminger & Shulman, 2003; Knott et al., 2006; Laskaard et al., 2010) 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.

Although the results of this study generally indicated improved social behavior as an outcome of the intervention, there were some limitations to this study. For example, because Participant 3's initiations decreased by the sixth session, this may suggest a slightly weaker and unstable improvement for this participant, or it may suggest that medication may have confounded the results. Future studies in this area may be important to conduct. Another limitation to our study was the lack of generalization measures for our participants. Anecdotally, however, Participant 1 has maintained his friendship with peers he has met from the SSO and has met with his newly obtained friends outside of the school setting. Furthermore, as the facilitators were all undergraduate psychology majors, there is a slight possibility that the results were achieved because of the facilitators' relatively high level of sophistication compared to many playground aides. Future research focused on aide qualification and training may be important. It may also be important to conduct future research aimed at accessing and measuring the duration and significance of the new friendships formed through such social clubs. Overall, the present research suggests optimism in developing friendships for adolescents with autism, and future research and practice in this area may be especially important.

Acknowledgments

Thank you to the families with children with ASD who participated and the schools that welcomed our Lunch Clubs. The authors also wish to thank James Street for his contributions on

the initial phases of the research project, and our two coders Lauren Seadler and Natalie Debbas.

Declaration of Conflicting Interests

The author(s) declared the following potential conflicts of interest with respect to the research, authorship, and/or publication of this article: Robert and Lynn Koegel are partners in the private company, Koegel Autism Consultants, LLC.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Funding for this research was provided by an URCA grant from the University of California, Santa Barbara, and by NIH research grant DC010924 from NIDCD.

References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- Attwood, T. (2000). Strategies for improving the social integration of children with Asperger syndrome. *Autism, 4*, 85–100.
- Baker, M. J. (2000). Incorporating the thematic ritualistic behaviors of children with autism into games: Increasing social play interactions with siblings. *Journal of Positive Behavior Interventions, 2*, 66–84.
- Baker, M. J., Koegel, R. L., & Koegel, L. K. (1998). Increasing the social behavior of young children with autism using their obsessive behaviors. *Journal of the Association for Persons With Severe Handicaps, 23*, 300–308.
- Barlow, D. H., & Hersen, M. (1984). *Single case experimental designs: Strategies for studying behavior change* (2nd ed.). New York, NY: Pergamon.
- Bauminger, N., & Shulman, C. (2003). The development and maintenance of friendship in high-functioning children with autism: Maternal perceptions. *Autism, 7*, 81–97.
- Bellini, S., Peters, J. K., Benner, L., & Hopf, A. (2007). A meta-analysis of school-based social skills interventions for children with autism spectrum disorders. *Remedial and Special Education, 28*, 153–162.
- Centers for Disease Control and Prevention. (2009). Autism spectrum disorders (ASDs). Retrieved from <http://www.cdc.gov/ncbddd/autism/signs.html>
- Chan, J. M., Lang, R., Rispoli, M., O'Reilly, M., Sigafoos, J., & Cole, H. (2009). Use of peer-mediated intervention in the treatment of autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders, 3*, 876–889.
- Charlop, M. H., Kurtz, P. F., & Casey, F. G. (1990). Using aberrant behaviors as reinforcers for autistic children. *Journal of Applied Behavior Analysis, 23*, 163–181.
- Christopher, J. S., Nangle, D. W., & Hansen, D. J. (1993). Social-skills interventions with adolescents: Current issues and procedures. *Behavior Modification, 17*, 314–338.
- Cohen, J. M. (1977). Sources of group homogeneity. *Sociology of Education, 50*, 227–241.
- DiSalvo, C. A., & Oswald, D. P. (2002). Peer mediated interventions to increase the social interaction of children with autism: Consideration of peer expectancies. *Focus on Autism and Other Developmental Disorders, 17*, 198–207.
- Farrugia, S., & Hudson, J. (2006). Anxiety in adolescents with Asperger syndrome: Negative thoughts, behavioral problems, and life interference. *Focus on Autism and Other Developmental Disorders, 21*, 25–35.
- Feld, S. L. (1982). Social structure determinants of similarity among associates. *American Sociological Review, 47*, 791–801.
- Gengoux, G. W. (2009). Priming for games and cooperative activities with children with autism: Effects on social interactions with typically developing peers. *Dissertation Abstracts International: The Sciences and Engineering, 69*(8-B), 5024.
- Gillott, A., Furniss, F., & Walter, A. (2001). Anxiety in high-functioning children with autism. *Autism, 5*, 277–286.
- Hillier, A., Fish, T., Cloppert, P., & Beversdorf, D. Q. (2007). Outcomes of a social and vocational skills support group for adolescents and young adults on the autism spectrum. *Focus on Autism and Other Developmental Disorders, 22*, 107–115.
- Kasari, C., & Rotheram-Fuller, E. (in press). Peer relationships of children with Autism: Challenges and interventions. In E. Hollander & E. Anagnostou (Eds.), *Clinical manual for the treatment of Autism*. Arlington, VA: American Psychiatric Publishing, Inc.
- Kim, J. A., Szatmari, P., Bryson, S. E., Streiner, D. L., & Wilson, F. J. (2000). The prevalence of anxiety and mood problems among children with autism and Asperger syndrome. *Autism, 4*, 117–132.
- Klin, A., Volkmar, F. R., & Sparrow, S. S. (2000). *Asperger syndrome*. New York, NY: Guilford.
- Knott, F., Dunlop, A. W., & Mackay, T. (2006). Living with ASD: How do children and their parents assess their difficulties with social interaction and understanding? *Autism, 10*, 609–617.
- Koegel, L., Koegel, R. L., Shoshan, Y., & McNeerney, E. (1999). Pivotal response intervention II: Preliminary outcome data. *Journal of Several Handicaps, 24*, 186–198.
- Koegel, L., Vernon, T., Koegel, R. L., Koegel, B., & Paullin, A. W. (in press). Improving socialization between children with autism spectrum disorder and their peers in inclusive settings. *Journal of Positive Behavioral Intervention*.
- Koegel, L. K., Koegel, R. L., Frea, W., & Green-Hopkins, I. (2003). Priming as a method of coordinating educational services for children with autism. *Language, Speech, and Hearing Services in Schools, 34*, 228–235.
- Koegel, L. K., Koegel, R. L., Harrower, J. K., & Carter, C. M. (1999). Pivotal response intervention I: Overview of approach. *Journal of the Association for Persons With Severe Handicaps, 24*, 174–185.
- Koegel, R., Dyer, K., & Bell, L. K. (1987). The influence of child-preferred activities on autistic children's social behavior. *Journal of Applied Behavior Analysis, 20*, 243–252.

- Koegel, R. L., & Koegel, L. K. (2006). *Pivotal response treatments for autism: Communication, social, and academic development*. Baltimore, MD: Brookes.
- Lasgaard, M., Nielsen, A., Eriksen, M. E., & Goossens, L. (2010). Loneliness and social support in adolescent boys with autism spectrum disorders. *Journal of Autism and Developmental Disorders, 40*, 218–226.
- Moxon, L., & Gates, D. (2001). Children with autism: Supporting the transition to adulthood. *Educational and Child Psychology, 18*(2), 28–38.
- Reichow, B., & Volkmar, F. R. (2010). Social skills interventions for individuals with autism: Evaluation for evidence-based practices within a best evidence synthesis framework. *Journal of Autism and Developmental Disorders, 40*, 149–166.
- Rogers, S. J. (2000). Interventions that facilitate socialization in children with autism. *Journal of Autism and Developmental Disorders, 30*, 399–409.
- Simpson, R. L. (2004). Finding effective intervention and personal preparation practices for students with autism spectrum disorder. *Council for Exceptional Children, 70*, 135–144.
- Smith, T., Lovaas, N. W., & Lovaas, O. I. (2002). Behaviors of children with high-functioning autism when paired with typically developing versus delayed peers: A preliminary study. *Behavioral Intervention, 17*, 129–143.
- Stewart, M. E., Barnard, L., Pearson, J., Hasan, R., & O'Brien, G. (2006). Presentation of depression in autism and Asperger syndrome: A review. *Autism, 10*, 103–116.
- Sze, K. M., & Wood, J. J. (2007). Cognitive behavioral treatment of comorbid anxiety disorders and social difficulties in children with high-functioning autism: A case report. *Journal of Contemporary Psychotherapy, 37*, 133–143.
- White, S. W., Keonig, K., & Scahill, L. (2007). Social skills development in children with autism spectrum disorders: A review of the intervention research. *Journal of Autism and Developmental Disorders, 37*, 1858–1868.
- Wolery, M., Kirk, K., & Gast, D. L. (1985). Stereotypic behavior as reinforcer: Effects and side effects. *Journal of Autism and Developmental Disorders, 15*, 149–161.
- Wood, J. J., & Gadow, K. W. (2010). Exploring the nature and function of anxiety in youths with autism spectrum disorder. *Clinical Psychology Science and Practice, 17*, 281–292.
- Zanolli, K., Daggett, J., & Adams, T. (1996). Teaching preschool age autistic children to make spontaneous initiations to peers using priming. *Journal of Autism and Developmental Disorders, 26*, 407–422.