

# Increasing the Social Behavior of Young Children With Autism Using Their Obsessive Behaviors

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*This study systematically asked whether individual topics or themes on which children with autism perseverated across a variety of settings (often called obsessions) could be used to create the theme for a socially appropriate game. Data collected within the context of a multiple baseline design revealed very low levels of social interaction during play periods in the baseline condition. In contrast, when the children with autism were taught a socially appropriate game (e.g., one child who perseverated on maps was taught a tag game played on a giant outline of a US map), the percent of social interactions increased dramatically and continued to be high during follow-up measures. Generalization measures indicated that following intervention, the children also demonstrated increases in social interaction during other play activities. The results are discussed in terms of incorporating obsession themes into common games to create intrinsically reinforcing appropriate activities for increasing social interactions, and in relation to developing activities that capitalize on the child with autism's interests, so that the child is a valued member of the peer group.*

**DESCRIPTORS:** autism, obsessions, generalization measures, social behavior

One of the defining criteria for autism is extreme difficulty with social behavior. Even when social skills improve while some individuals interact with adults, many young children with autism continue to exhibit little or no social interactions with peers (Scott & Gilliam, 1987). They may actively avoid social contact with others, adhere to rigid schedules, and inappropriately perseverate on objects or topics.

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The early intervention studies on social interactions of children with autism focused on teaching specific social skills (Beck & Forehand, 1984; Pellegrini & Urbain, 1985; Williams, 1989). Many of these studies relied on creating special social skills training groups and teaching individual skills such as appropriate eye contact, turn taking, sharing, and asking for help (Kamps et al., 1992; Koegel & Frea, 1993; Taras, Matson, & Leary, 1988). Other strategies, which resulted in increases in social interactions and play in children with autism, focused on teaching typically developing peers to initiate play with children with autism (Brady, Shores, McEvory, Ellis, & Fox, 1987; Ragland, Kerr, & Strain, 1978; Strain, Kerr, & Ragland, 1979). Although such methods revealed increases in the interaction of children with autism and their peers, generalization to nontraining situations and peers continued to be problematic (Odom & Strain, 1984).

The need for social reciprocity for the development of pragmatically appropriate social interactions led researchers to examine the effects of teaching children with autism to initiate interactions with their nondisabled peers (Haring & Lovinger, 1989). Furthermore, Oke and Schreibman (1990) found that social interactions not only increased, but disruptive behaviors also decreased with this type of intervention. Gaylord-Ross, Haring, Breen, and Pitts-Conway (1984) conducted a study to increase social interactions by teaching autistic adolescents to initiate social interactions by sharing highly desired age-appropriate objects with peers. The objects were used to promote social encounters and were selected to be reinforcing to both the autistic students and the nondisabled peers. The results showed increases in the frequency of initiations, the duration of interactions, and generalization across peers (but not settings). The use of preferred objects may have helped increase the intrinsic motivation to socially interact for both the adolescents with autism and typically developing adolescents. Another study that employed child preference of conversational topics and play activities to increase autistic children's social behavior was conducted by Koegel, Dyer, and Bell (1987). They found a negative correlation between child-preferred activities and social avoidance and demonstrated that children

can be taught to initiate child-preferred activities in community settings, thereby reducing social avoidance behaviors.

Such studies demonstrate that, under controlled conditions within the context of a community setting, procedures can be implemented for promoting interactions between children with autism and their typically developing peers (Odom, Hoyson, Jamieson, & Strain, 1985). Systematically building on this research has been the addition of a greater number of naturalistic techniques (those that are conducted in more loosely controlled contexts) to improve the generalization and durability of social interactive play with peers (Pierce & Schreibman, 1995).

Specifically included in such studies were motivational components, such as child choice of stimulus materials, interspersing of maintenance trials (tasks the child has already mastered) among new acquisition trials, using natural reinforcers that are directly related to the child's response, and reinforcing attempts at social interactions and functional play (cf. Koegel, O'Dell, & Koegel, 1987). These components may have been particularly important because, in general, children with autism seem very unmotivated (Koegel & Egel, 1979). Therefore, incorporating these components into the teaching situations appears to motivate the children to socially interact and initiations often occur spontaneously.

In contrast to their lack of motivation to engage in social interactions, one area where many children with autism seem to be especially motivated relates to idiosyncratic objects, topics, and themes on which a child perseverates across multiple settings (often called obsessions). Some have hypothesized that these obsessions may be very reinforcing forms of self-stimulatory behavior which oftentimes are problematic and dysfunctional (Epstein, Taubman, & Lovaas, 1985). These obsessions seem to be child preferred and generally occur at a high frequency (Lovaas, Newsom, & Hickman, 1987). Although typically viewed as abnormal, some researchers have shown that such behaviors can be incorporated effectively into intervention programs that increase appropriate behaviors without increasing the time engaged in the obsessive behavior (Wolery, Kirk, & Gast, 1985). For example, perseverative or stereotyped ritualistic behaviors have been used as reinforcers to improve correct responding (Wolery, 1978; Wolery et al., 1985), to increase the use of spontaneous appropriate sentences (Hung, 1978), to increase pre-occupational work rates (Sugai & White, 1986), to increase correct task performance (Charlop, Kurtz, & Casey, 1990), and to decrease off-task, stereotypy, aggression, and tantrum behaviors (Charlop-Christy & Haymes, 1996). This approach allows behaviors that are difficult to eliminate to be used as an advantage to teach new adaptive responses. Further, Charlop et al. (1990) also noted that using the obsessive behaviors as a reinforcer

did not cause increases in the perseverative behavior during other times of the day.

This study extends this line of research by analyzing whether obsessive behaviors could be used functionally as the theme of an appropriate social game, and whether the game in turn would increase social interactions between children with autism and their nondisabled peers. The literature suggests that the use of an autistic child's perseverations incorporated into social play interactions could be successful in two ways. First, it may produce interest in the appropriate social activity and create positive affect. Second, because of the intrinsic reinforcement the obsessive behavior may introduce into the appropriate social game, generalization and maintenance may be more likely to occur. Specifically, we asked whether an intervention based on incorporating an autistic child's obsessive behavior into an appropriate social game would (1) increase the percent of time engaged in social interactive play; (2) result in generalization and maintenance to other social interactive play; and (3) result in increased positive affect during the social interactions for both children with autism and for their typically developing peers.

## Method

### Participants

Three children who were diagnosed with autism, according to criteria outlined in the 4th ed. of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association, 1994), by two independent agencies participated in this study. Individual child descriptions are as follows.

Don was 7 years and 7 months old at the start of the study. He participated in a full-inclusion second-grade class in a public elementary school with assistance from special education support personnel. He participated in most of the academic activities during classtime. However, he frequently engaged in off-task behavior, primarily consisting of incessant repetitive speech about certain obsessive topics (especially U.S. states). He generally played in isolation at recess and lunch periods, with his activities primarily consisting of sitting on top of the jungle gym apparatus and displaying stereotypic behavior (blank stare and finger flapping). His Vineland Adaptive Behavior Scales adaptive behavior composite score was 65. His overall IQ score on the Wechsler Intelligence Scale for Children (WISC-III) was 83 (verbal = 65, performance = 106). He was able to combine four to five words to form grammatically correct sentences, but he rarely engaged in social communication.

Amy was 5 years and 4 months old at the start of the study. She attended a full-inclusion preschool during the initial portion of the baseline condition. She completed the baseline in a full-inclusion public school kindergarten class with the assistance of special education support personnel. She engaged in most of the same

academic activities as her peers, but she did not socially interact with the other children. She generally exhibited disruptive behavior, such as yelling or loudly saying phrases such as "Go away!" when other children approached her. Her free-time periods primarily consisted of playing in isolation with dolls and Disney characters, swinging, or wandering around. In addition, Amy persistently engaged in various repetitive behaviors relating to Disney characters, such as insisting on wearing Disney clothing and repeatedly asking for Disney paraphernalia. She obtained a Vineland Adaptive Behavior Scales adaptive behavior composite score of 65. Amy could speak in simple three to four-word sentences but rarely initiated conversations and usually did not respond to others' initiations.

Jenny was 8 years and 9 months old at the start of the study. She was enrolled in a special education fourth-grade class with part-time mainstreaming. Her academic performance was higher than her peers in her special education class, but about 1 year below her age level in the regular education classroom. She tended to play in isolation at recess periods, typically swinging on a particular swing. She cried and threw tantrums when other children requested that she share the swing. At home and school Jenny demonstrated obsessions with movies. She had seen and memorized virtually every current child-oriented movie, knew all the characters' names, and continuously repeated exact scripts of the movies. Her reported IQ on the Leiter International Performance Scale was 107. Her age-equivalent scores on the Peabody Picture Vocabulary-Revised Test and the Expressive One Word Picture Vocabulary Test were 6 years 3 months and 6 years 10 months, respectively. Jenny engaged in lengthy monologues related to movies with adults, but rarely engaged in appropriate social interactions with peers.

### Design and Procedures

A multiple baseline across participants design (Barlow & Hersen, 1984) was employed to assess whether an intervention based on incorporating an autistic child's obsession theme into an appropriate social game would increase the time and quality of social interactive play. Data were collected in randomly selected 10-minute probes, twice weekly, during regular recess or lunch periods at each child's school setting during the baseline, intervention, and follow-up conditions.

**Baseline.** During the baseline condition, the children participated in activities during their regular recess and lunch settings without any special manipulations or instructions. The children were free to engage in any games or activities. As a control for the initial prompting to start the games during the intervention sessions, two or three baseline sessions were selected for each child (see arrows in Fig. 1). Adults and peers were asked to prompt the child with autism to play the same games that would be used in the intervention, but with-

out the inclusion of the obsession theme (e.g., "Don, let's play tag," or "Amy, let's play follow the leader"). Throughout all phases of the study, none of the participants were aware of the hypotheses or the experimental conditions.

**Intervention.** To determine each child's obsession theme to be incorporated into the playground games, an obsession topic was chosen following interviews with each child's teacher, teacher's aide, and parent, and informal child observations. For the obsession topic to be chosen, the topic had to be considered by all of the observers and interviewees to be abnormally perseverative. Each obsession theme was then incorporated into a common playground game in accordance with the rules of the playground, the age of the children, and without limitation to the number of children who could participate.

Intervention consisted of an adult prompting each target child, as well as any group of nondisabled peers who showed interest and approached the activity, to play a game that was commonly played at school, but which was modified to include the autistic child's obsessive behavior as a theme. Participation in the game was voluntary (participants varied from day to day) and no extrinsic reinforcers were provided. There usually were enough children to play the game. The nondisabled children often initiated the game. On occasions when participants were not readily available in the game area, the child with autism was prompted to recruit peers to engage in the game (e.g., to say, "Let's play the [obsession theme] Game"). The above types of prompting were performed one to two times during the initial days of intervention, fading during the remaining 1 to 2 days of the intervention phase. At that point, and for the remainder of the study, all of the children's selection of and participation in games and activities was entirely independent and voluntary, with no adult prompting.

**Child 1.** Don's obsession theme was the geography of the United States (e.g., he had memorized the location of every state and capital in the country). This obsessive topic was incorporated into a tag game that took place on a giant outline drawing of a map of the United States located on the outside playground. The game consisted of one "caller" (either the child with autism or a nondisabled peer) who would yell out the name of a state and indicate how the other children should travel there (i.e., hopping, running, walking, twirling). After the "call" (e.g., "hop on one foot to Maine" or "run to California"), the other children would try to travel to the state without getting tagged by the caller. If a child was tagged then she became the new caller. If no one was tagged, the caller called out another state and the traveling mode and continued to do so until someone was tagged.

**Child 2.** Amy's obsession theme was obtaining and repeatedly interacting with paraphernalia relating to

Disney characters. The Disney theme was incorporated into a follow the leader game. The game was introduced to the children as the "Follow Mickey Game." It consisted of each child picking out and wearing a Disney character hat or laminated emblem (i.e., Mickey Mouse, Minnie Mouse, Goofey, or some other character hat or emblem). The child wearing the Mickey Mouse emblem was the leader. That child could go on any play equipment in the kindergarten play yard or travel around the play area in any manner (i.e. run, hop, or skip) and all the other children were to follow and imitate the leader. After a circuit of the playground, any participating child could call out "change characters." Upon hearing that request, each child was required to trade emblems with someone else. Again, the new child with the Mickey Mouse emblem would lead the group.

**Child 3.** Jenny's obsession theme was movies (i.e., she memorized every current movie title, characters, and much of the scripts). Movie themes were incorporated into a tag game, using 10 to 15 laminated photocopies of pictures on current child-oriented rental movie boxes. The movie pictures were placed around a large outside grassy play area and were considered to be "bases" of safety. The object of the game was for a caller to quote something from one of the movies, name a character, or describe a scene. Then the other children needed to run to that movie to be safe from being tagged by the caller. If a child was tagged, that child became the caller. If no one was tagged, the caller would continue.

**Maintenance.** The maintenance condition was a return to the baseline condition (without any adult initiations). This occurred in the same outside play setting, with the exception of the availability of the new game materials where relevant (e.g., placards). As in the baseline, the children were free to engage in any games or activities.

**Follow-ups.** Follow-up sessions were conducted approximately 1 and 2 months after the end date of the maintenance condition to assess long-term maintenance of appropriate social play interactions. All conditions were exactly the same as in the baseline and maintenance condition, with no adult initiations.

### Dependent Measures

Data were collected for two dependent measures throughout the study: (1) time engaged in social play interactions in obsession and nonobsession theme games and (2) subjective ratings of child affect. Appropriate social play interactions were defined as the child with autism actively participating in a game or social activity; being attentive to the game or social activity; playing with the other children, and not just with an object; exhibiting reciprocal turn taking as per the rules of the game or activity; and not ritualistically engaging in obsessive behaviors. In contrast, inappropriate social

interactions were defined as playing alone; engaging in inhibiting stereotypic behavior; engaging in ritualistic behaviors related to the obsession theme; and/or not responding appropriately or not attending to the other children during a game.

Time engaged in social play interactions was calculated as the percent of 10-sec intervals with social play interactions during each 10-minute probe. A full interval scoring system was utilized. Additionally, an observer unfamiliar with the experimental hypotheses or conditions rated the target child and a composite of the peers (based on the average behavior of two different randomly selected peers at each session) on two 6-point scales relating to interest and happiness (based on the Dunlap and Koegel Affect Scale, 1980) at the end of each 10-minute probe. The scales ranged from zero (disinterested/unhappy) to five (interested/happy). Table 1 shows the specific scales.

**Reliability.** Two observers, at least one of whom who was naive to the purpose of the study, independently recorded each child's percent of intervals with appropriate social play interactions in vivo or from videotapes. Reliability was computed on an interval-by-interval basis for approximately 33% of the sessions in all conditions for each child. An agreement was counted when both of the observers recorded an interval with the target child engaging in appropriate social play interactions or when both observers recorded an interval with the target child not engaging in appropriate social play interactions. Disagreements were defined as one of the observers recording the target child engaging in appropriate social play during an interval and the other observer not recording the target child engaging in appropriate social play during the interval. Reliability was calculated for each session using the formula: number of agreements divided by the number of agreements plus disagreements times 100. Reliability was also computed for 20% of the sessions for the affect measure. Agreements for recording affect were defined as both observers recording within the same category (positive, neutral, or negative).

The average percentage agreement for appropriate social play interactions for Don was 94% with a range from 80% to 100%. The average percentage agreement for Amy for appropriate social play interactions was 97% with a range of 87%–100%. The average percentage agreement for Jenny was 94% with a range of 78%–100%. Percentage agreement for the affect measure for Don was 100%, for Don's peer composite it was 75%, for Amy it was 100%, for Amy's peer composite it was 83%, for Jenny it was 75%, and for Jenny's peer composite it was 75%.

### Results

Figure 1 shows the percentage of intervals with the target children engaged in appropriate social play in-

Table 1  
Rating Scale for Child Affect

INTEREST		
Disinterested	Neutral Interest	Interested
Child looks bored, noninvolved not curious or eager to continue activity. May yawn or try to avoid the situation. Spends much time looking around and not attending to task. If child does respond may be long response latency. (Score 0 or 1, depending on extent of disinterest)	Neither particularly interested nor disinterested. Child seems to passively accept situation. Doesn't rebel but is not eager to continue. (Score 2 or 3, depending on extent of interest)	Attends readily to task; responds readily and willingly. Child is alert and involved in activity. (Score 4 or 5, depending on level of alertness and involvement)
I ————— I 0 ————— 1	I ————— I 2 ————— 3	I ————— I 4 ————— 5
HAPPINESS		
Unhappy	Neutral	Happy
Cries, pouts, tantrums, appears to be sad, angry, or frustrated. Child seems not to be enjoying self. (Score 0 or 1 depending on extent of unhappiness)	Doesn't appear to be decidedly happy or particularly unhappy. May smile or frown occasionally but overall, seems rather neutral in this situation. (Score 2 or 3, depending on extent of happiness)	Smiles, laughs approximately seems to be enjoying self. (Score 4 or 5, depending on extent of enjoyment)
I ————— I 0 ————— 1	I ————— I 2 ————— 3	I ————— I 4 ————— 5

teractions during recess/lunch periods. In the baseline condition, all 3 children exhibited low levels of social play interactions. For example, Don socially interacted with his peers an average of 19% (range = 0%–55%) of the intervals for 7 sessions. Amy rarely socially interacted with her peers, averaging only 2% (range = 0%–10%) of the intervals with social play for 10 sessions. Similarly, Jenny averaged 15% (range = 0%–37%) of the intervals with social play interaction with her peers for 13 sessions.

The data show that during the intervention, maintenance, and follow-up phases, all 3 children showed increases in their appropriate social behavior. Specifically, during intervention, Don averaged 66% (range = 60%–75%) of the intervals with appropriate social play interactions whereas Amy averaged 76% (range = 60%–87%). Jenny immediately began engaging in appropriate social play interactions during 100% of the intervals and continued at this level throughout the intervention phase.

#### Maintenance

To assess whether the children's appropriate social behavior would maintain in the absence of the adult who introduced the game, a maintenance condition was conducted without the presence of the adult who taught the game. Under these conditions, Don continued to play the obsession theme game on some days, averaging 88% (range = 70%–100%) of the intervals with appropriate social interactions (indicated by closed circles). Further, on other days when Don did not engage in the obsession theme game, he played other non-

obsession theme games with appropriate social interactions occurring during an average of 80% (range = 69%–87%) of the intervals (indicated by open circles). Amy also continued to play her obsession theme on some days and averaged 70% (range = 48%–88%) of the intervals with appropriate social interactions (indicated by closed circles). Similar to Don, on days when Amy did not engage in the obsession theme game, she engaged in nonobsession theme games with appropriate social interactions occurring during an average of 56% (range = 50%–62%) of the intervals (indicated by open circles). Last, Jenny also continued to play the obsession theme on some days, averaging 77% (range = 50%–95%) of the intervals with appropriate social interactions (indicated by closed circles). In addition, on days when she did not engage in the obsession theme game, she engaged in nonobsession theme games with appropriate social interactions averaging 97% (range = 93%–100%) of the intervals (indicated by open circles).

#### Follow-up

The children continued to engage in appropriate social play interactions during 1- and 2-month follow-up sessions. Specifically, Don averaged 69% (range = 51%–83%) of the intervals with appropriate social play interactions during the follow-up sessions. Further, Don's appropriate social play interactions occurred on other days, averaging 71% (range = 51%–83%) of the intervals (indicated by open circles) during nonobsession theme games. Amy averaged 80% (range = 53%–95%) of the intervals with appropriate social play in-

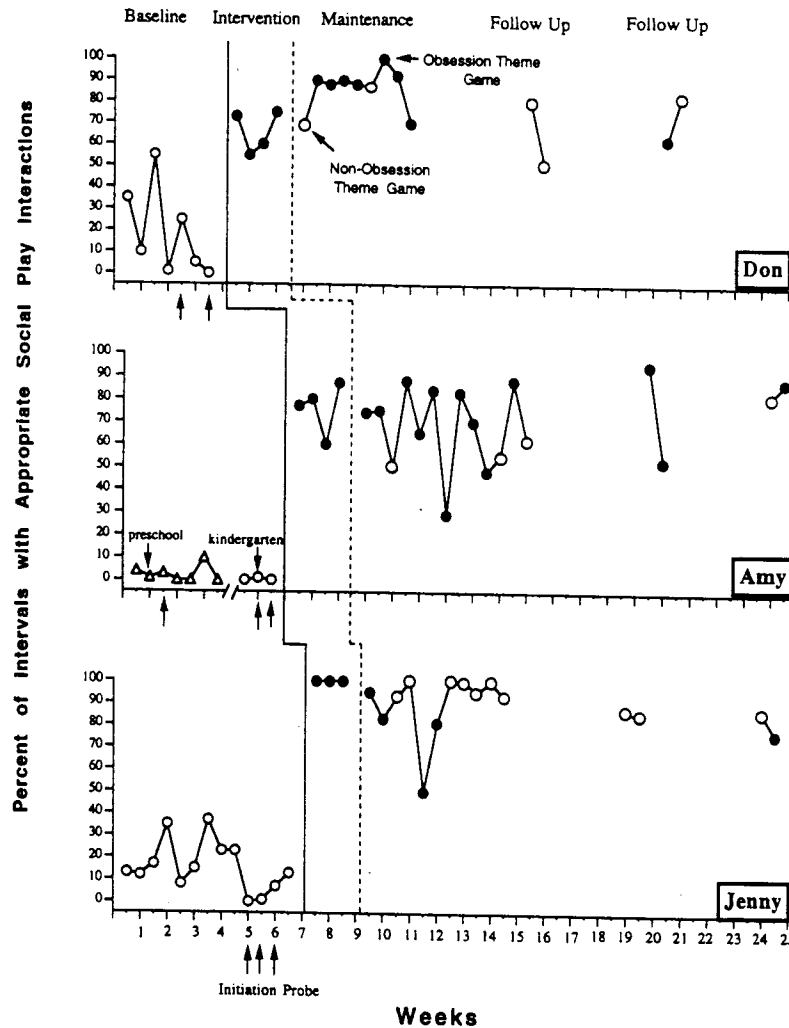


Figure 1. The percentage of intervals the children with autism engaged in appropriate social play interactions during recess and lunch periods during the baseline, intervention, maintenance, and follow-up conditions. Closed circles, obsession theme games; open circles, nonobsession theme games.

interactions. Amy also engaged in appropriate social interactions during nonobsession theme games, exhibiting appropriate social play interactions in 82% of the intervals during the 2-month follow-up session (indicated by open circle). Finally, Jenny averaged 84% (range = 77%–87%) of the intervals with appropriate social play interactions during the follow-up sessions. Similar to Don, Jenny's appropriate play interactions occurred on other days during nonobsession games, averaging 86% (range = 85%–87%) of the intervals (indicated by open circles).

**Ratings of Affect**

The target children and a peer composite were scored on two dimensions of affect (interest and happiness) related to the games. Due to the high correla-

tion of the two dimensions, an average was obtained for each 10-minute session to form composite ratings of affect. In Figure 2, a rating of 3.3 to 5 indicates a positive score (i.e., very interested, very happy), 1.71 to 3.29 indicates neutral affect (i.e., neither interested nor disinterested/neither decidedly happy nor particularly unhappy), and 0 to 1.7 indicates a negative score (i.e., disinterested/unhappy). The data show that during the intervention condition, their ratings of affect increased as did the affect of their peers. These increases in affect were also evident during the maintenance and follow-up sessions.

Don's average affect score during the baseline condition was 2.9 (neutral) and the average peer composite was 3.2 (neutral). During the intervention condition, Don's average affect score increased to 4.5 (positive) and the average peer composite affect score was 4.4

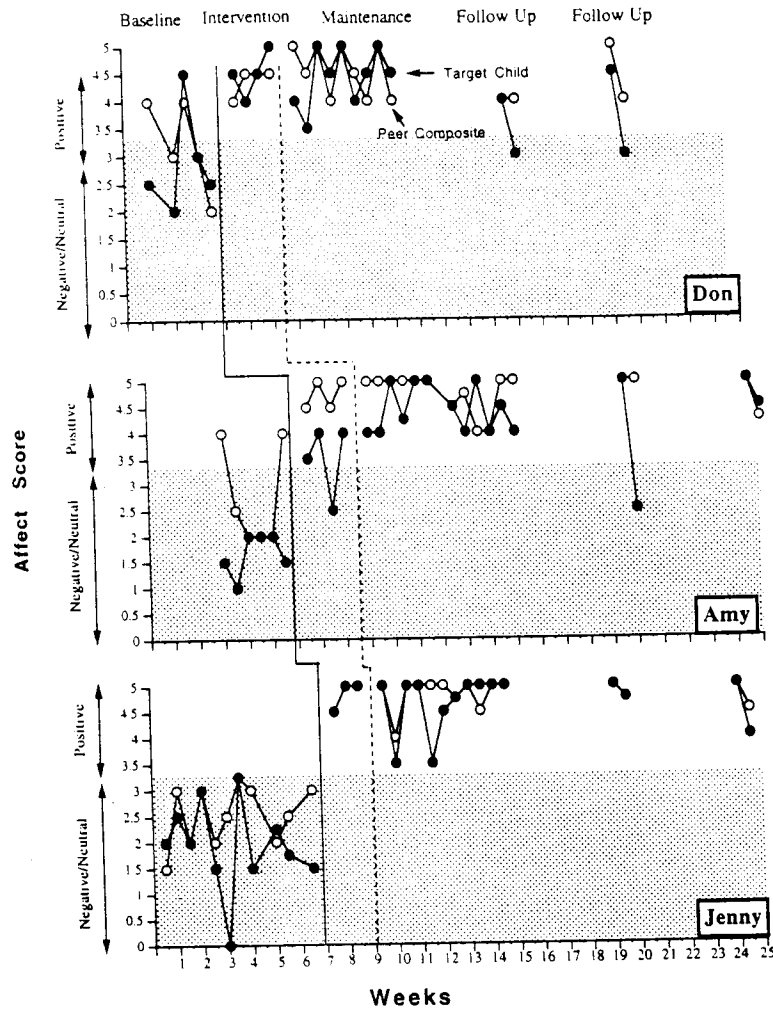


Figure 2. The average affect scores for the children with autism (closed circles) and their peers (open circles) during baseline, intervention, maintenance, and follow-up conditions.

(positive). The positive affect continued for both Don and his peers during the maintenance and follow up conditions. Don's average affect score during the maintenance sessions was 4.5 (positive) and it was 3.6 (positive) during the follow-up sessions. The peer composite average affect score during the maintenance condition was 4.6 (positive) and during the follow-up condition it was 4.25 (positive).

Amy and her peers' affect also increased from neutral during the baseline condition to positive during intervention, maintenance, and follow-up. Amy's baseline average affect score was 1.7 (negative) and the peer composite was 2.75 (neutral). During the intervention condition, Amy's average affect score increased to 3.5 (positive) and the peer composite was 4.75 (positive). Amy's average affect was 4.4 (positive) during the maintenance condition and 4.25 (positive) at follow-up. Her peer composite average affect score was 4.8 (posi-

itive) during the maintenance condition and 4.8 (positive) at follow-up.

Similar to Don, Jenny showed an increase in average affect scores from neutral during the baseline condition to positive during intervention, maintenance, and follow-up. Jenny's average affect score during baseline was 2.0 (neutral) and the peer composite was 2.5 (neutral). Jenny's average affect score increased to 4.8 (positive) and the peer composite to 4.2 (positive) during the intervention condition. The positive affect continued during the maintenance and follow-up, averaging 4.65 (positive) and 4.7 (positive), respectively. Likewise, her peer composite average affect score was 4.8 (positive) during the maintenance and 4.8 (positive) at follow-up.

## Discussion

Results of this investigation showed that the obsession themes of children with autism, which are typically

viewed as problematic, can be transformed successfully into common games to increase positive social play interactions between children with autism and their typically developing peers in inclusive school environments. These increases in appropriate social play interactions maintained in the absence of the adult who initially prompted the game. Further, the appropriate social play generalized to other nonobsession theme games following intervention. Additionally, both the children with autism and their nondisabled peers' affect increased positively, showing improved interest and happiness following intervention.

These results are interesting in light of several issues. First, although the children with autism and their peers were prompted to engage in playground games during baseline, this did not seem to be sufficient to result in improvements in their social behavior. However, following incorporation of the obsession theme into the games, the children with autism appeared to be highly motivated to engage in and maintain appropriate social interactions. These findings are consistent with research showing that as children with autism improve with intervention programs, their stereotypy or self-stimulatory behaviors change from low-level typologies (e.g., rocking, spinning) to higher-level typologies (e.g., verbal perseverations, conversational obsessions), yet maintain their very strong reinforcing properties (Charlop et al., 1990; Epstein et al., 1985; Lovaas et al., 1987).

The result showing improvements in affect for both the children with autism and their nondisabled peers is interesting. Several researchers have suggested that to develop relationships between children with and without disabilities, activities need to be mutually reinforcing (Hurley-Geffner, 1995; Rogers & Lewis, 1989). The improvements in affect in the present study suggest that the games were mutually reinforcing for all the children involved. More controlled social validation data may be important for future research in order to assess the mutual reinforcement properties of the games. Second, considering social reciprocity may have been important so that both the children with autism and their nondisabled peers had equitable roles in the relationship rather than "helper/helpee" roles (Hurley-Geffner, 1995; Strain, Odom, & McConnell, 1984; Strain & Shores, 1977; Van der Klift & Kunc, 1994). In the present study, the games were designed to be interesting and age appropriate and to incorporate strengths that the children with autism could bring to the game. Thus, the children with autism appeared to be inherently valued members of the games and did not need additional assistance from their peers. The positive affect results and anecdotal comments made by the peers support the notion that reciprocal meaningful relationships were formed between the children with autism and their nondisabled peers. Also, the children with autism in this study were viewed as socially competent due to their expertise related to the obsession theme incorporated

into the game. For example, after the intervention, the peers commented on the positive skills that the children with autism exhibited (e.g., "He's the smartest kid in the school, he knows all of the states"). This perceived value as a contributing member of the social group may have been a factor in the high level of social play interactions following intervention and during nonobsessive theme games. This is consistent with Guralnick's (1990) suggestion that the competence of children during social interactions, and not the fact that they have a disability, is the key variable to improving social relationships and their status among peers. Future research to systematically address these variables may enhance our knowledge of these issues.

Also, it is interesting to note that anecdotal comments by the parents and teachers of the children participating in the study suggested no increases in the autistic children's obsessive behaviors as an undesirable side effect of the intervention. In fact, for two of the children, the parents and teachers reported what appeared to be a decrease in obsessive behavior following the initiation of the games. This is consistent with Charlop et al. (1990), who suggested that when obsession themes were used as a reinforcer for appropriate behavior, they did not increase during other times of the day. The present study showed increases in appropriate social interactions (which by definition did not include obsessive ritualistic behaviors). However, it may be interesting for future research to measure obsessive ritualistic behaviors directly in order to assess possible inverse relationships.

The post comments by the parents and teachers suggest that appropriate behaviors actually may have replaced some of the children's inappropriate obsessive behaviors. That is, the children were reported to interact socially more with siblings, analogous to the observed increase in appropriate social behavior with peers following the intervention. It may be useful for future research to assess the generalization effects across varied settings such as in the classroom and home environments. Additional research in this area may prove profitable for understanding the nature and functions of obsessive and play behaviors and for increasing positive interactions among children with and without disabilities.

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