

Social Validation of Symbolic Play Training for Children with Autism

*Aubyn C. Stahmer, Children's Hospital and Health Center, University of California San Diego,
Laura Schreibman, University of California, San Diego and Nicole Palardy Powell,
University of Alabama*

Abstract

The present study examined the social significance of changes resulting from teaching symbolic play skills to children with autism using Pivotal Response Training (PRT). Qualitatively obtained results from a previous study indicated that, following symbolic play training, children with autism increased their symbolic play behaviors and play complexity to levels similar to that of typically developing children of similar language ages (Stahmer, 1995). To evaluate the social importance of these results, naïve judges rated the play of these same children before and after PRT. The judges rated the play of the children with autism as significantly better after training than before. The ratings indicated that the typically developing children exhibited qualitatively better play skills than the children with autism at both time periods. These findings demonstrate that improvements in symbolic play and play complexity after PRT are meaningful to people in the environment. In addition, they indicate continued qualitative symbolic play deficits for the children with autism that were not apparent in the objective measures. Key words: autism; social validity; symbolic play; pivotal response training.

The outcomes of behavioral interventions should be socially important and practically relevant, not simply statistically significant (Gresham, 2004; Kazdin, 1980; Schwartz & Baer, 1991; Wolf, 1978). Therefore researchers investigating behavioral treatment programs often complement traditional objective measures of program effectiveness with social validation assessments. The use of social validation allows the real world significance of treatment programs, as perceived by society at large, to be evaluated.

The use of social validation procedures is particularly important for evaluating the effects of behavior therapy in children with autism. The primary features of this disorder include severe deficits in language, play and social skills, as well as frequent engagement in restrictive and repetitive behaviors such as preoccupations with parts of objects, motor stereotypies, or compulsive behaviors (American Psychiatric Association, 1994). As a result of their autism, the behavior of these children is often perceived as aberrant by casual observers. Objective measures of behavioral treatments for children with autism have consistently indicated success in increasing appropriate skills and decreasing the amount of time children spend performing inappropriate behaviors (e.g., National Research Council, 2001). Social validation assessments have complimented the objective results, finding that such changes, when achieved, may result in a more favorable perception of these children by the general public, teachers, parents, and peers, implying that children show socially meaningful improvements (Runco & Schreibman, 1987; Runco & Schreibman, 1988; Schreibman, Koegel, Mills, & Burke, 1981; Kennedy, 2002). In addition, social validation measures often provide information regarding areas of skill deficits, which may not be detected by traditional objective measures. For example, Runco and Schreibman (1987) found that parents and teachers differed from professionals in their rating of the importance of certain target behaviors chosen for intervention. Other research in the area of social skills development has found discrepancies between positive, objective outcome measures and social validity assessments (Gresham, Cook, Crews, & Kern, 2004).

As noted in the diagnostic criteria for autism (American Psychiatric Association, 1994), symbolic play deficits are one hallmark characteristic of this disorder. While typically developing children show signs of symbolic play in the first two years of life, children with autism may never develop this skill. Additionally, most research has found that children with autism engage in less play overall, regardless of whether or not symbolic play is assessed (e.g., (Lewis & Boucher, 1988; Libby, Powell, Messer, & Jordan, 1998; Stone, Lemanek, Fishel, Fernandez, & Altemeier, 1990; Ungerer & Sigman, 1981; Wing, Gould, Yeates, & Brierley, 1977). These children may instead engage in other types of play behaviors that are qualitatively (e.g., less complex and more repetitive) and quantitatively (e.g., fewer symbolic play actions) different than the play of typically developing children or children with other developmental delays (Libby et al., 1998; Stone et al., 1990; Ungerer & Sigman, 1981). Some children with autism may perform a few symbolic play actions; however these are usually isolated events (Ungerer & Sigman, 1981) or very ambiguous examples of symbolic play (Baron-Cohen, 1987; Doherty & Rosenfeld, 1984).

This deficit in symbolic play has implications for other areas of development (see Wolfberg, 1999 for review). Symbolic play is correlated with language ability in both typically developing children and children with autism (e.g., Bates, Thal, Whitesell, Fenson, et al., 1989; Kasari, Freeman, & Paparella, 2001; Sigman & Ruskin, 1999; Ungerer & Sigman, 1981). Symbolic play in children with autism is closely linked to social development and peer interaction (Nadel & Peze, 1993; Wing et al., 1977) and deficits in this area may cause children to be less accepted by peers in social situations (e.g., Oden & Asher, 1977; Runco & Schreibman, 1988). Limited symbolic play in children with autism has also been associated with later deficits in theory of mind abilities (Warreyn, Roeyers, Peene, & De Groote, 2004).

A few studies have examined methods of improving symbolic play specifically (Goldstein, Wickstrom, Hoyson, Jamieson, & Et Al, 1988; Stahmer, 1995; Thorp, Stahmer, & Schreibman, 1995) or as part of a more comprehensive intervention program (e.g., Rogers & Lewis, 1989; Stahmer & Ingersoll, 2004). However, these studies have typically reported objective results such as the number of play actions exhibited, rather than the subjective quality of the symbolic play.

Stahmer (1995) used a naturalistic, behavioral technique called Pivotal Response Training (PRT) to teach symbolic play skills to children with autism. PRT is used to increase motivation and responsivity in children with autism (e.g., Koegel, O'Dell, & Koegel, 1987). Stahmer (1995) adapted PRT to specifically target symbolic play skills. Important aspects of training included child's choice of activity, turn taking, the use of multiple exemplars, reinforcing attempts at correct responding, interspersing maintenance tasks and using natural consequences (see Koegel et al., 1989).

According to objective measures used by Stahmer (1995), PRT increased symbolic play in each of the participants. After PRT, the children performed a higher number of symbolic play actions, had greater play complexity (as evidenced by linking actions together in a sequence), made more initiations to their play partners and responded to an increased number of their partners initiations. While these data are important and informative, they cannot fully describe the quality of the changes seen in the children's play. Given the prevalence of play in children's social interactions, and the complex nature of play skills, it is especially important to socially validate these results.

Anecdotal evidence of the social validity of the results was apparent in reports made by parents and teachers of the children with autism who participated (Stahmer, 1995). After the intervention, adults provided examples of creative and spontaneous symbolic play not reported before training. Some adults also reported increases in social interaction and greater apparent enjoyment of play activities. Although encouraging, these results are confounded by the fact that both parents and teachers had knowledge of the child's participation in the PRT program and the goals of the training. Therefore, a more systematic study

of the social acceptability of the children's play skills by individuals not associated with the research would enhance our knowledge of the effectiveness of the program.

The main goal of the present investigation was to systematically assess the social importance of treatment effects resulting from the PRT symbolic play intervention implemented by Stahmer (1995). Based on standard social validation methodology (see Foster & Mash, 1999; Storey & Horner, 1991) and our own previous research (Koegel, Dyer, & Bell, 1987; Runco & Schreibman, 1987; Schreibman et al., 1981; Schreibman, Kaneko, & Koegel, 1991), naïve observers rated the play of the same children with autism who participated in the Stahmer (1995) study and received the intervention described above. As the play behavior of the children could be viewed on a continuum with typical behavior, normative comparison was also conducted (Kendall, Marrs-Garcia, Nath, & Sheldrick, 1999). In addition, because the symbolic play was designed to affect changes, which might improve the child's acceptability to the general community, individuals with little knowledge of autism served as raters to obtain a judgment that would more closely approximate that of the general public (Schwartz & Baer, 1991). We predicted that these observers would rate the children with autism as more "typical" in their ability to play after their participation in the PRT symbolic play intervention.

Method

Participants

Naïve Judges. Sixty-three undergraduate psychology students at the University of California, San Diego served as judges. Students were recruited from lower division psychology courses in which participation in research projects is a requirement of the course. Typically students who enroll in these courses are freshmen; therefore it is likely that very few raters had more than a cursory knowledge of autism, psychology or symbolic play. Raters ranged in age from 18-22 years ($M=19.3$). Twenty-three raters were male and 30 were female. Although raters were not asked about their race/ethnicity, the demographics of the freshman class from which raters were drawn was as follows: 2.4% African American; 26.5% Asian; 9.9% Hispanic; 43.8% White and 17.4% of other ethnic origin. Raters were naïve to the purpose of the study until participation was complete, at which time they were debriefed.

Participants on stimulus tapes. Six male children with autism, diagnosed according to DSM-III-R criteria by agencies not associated with this research appeared on the stimulus tapes. The children ranged in age from 4 years 3 months to 7 years 2 months ($M=6$ years 6 months). The children had expressive language age scores as measured by the *Expressive One-Word Picture Vocabulary Test*, EOWPVT (Gardner, 1990) ranging from 2 years 7 months to 4 years 10 months ($M=3$ years 5 months). Their nonverbal IQ scores on the *Leiter International Performance Scales* (Leiter, 1979) ranged from 64-111 ($M=79$). These children were recruited through school and parent training programs. All of the children exhibited deficits in symbolic play as determined by parental report and behavioral observation. A more complete description of each of the children participating can be found in Stahmer (1995).

Six typically developing children (4 male, 2 female) matched with the experimental group for expressive language age (as measured by the EOWPVT) served as a normative comparison group. This particular control was chosen because language skills have been shown to be related to the ability to engage in symbolic play in both typically developing children (e.g., Bates et al., 1989; (McCune-Nicolich, 1981) and children with developmental disabilities (e.g., (Hill & McCune-Nicolich, 1981)). Typically developing children ranged in age from 2 years 5 months to 4 years 9 months ($M=3$ years 4 months). These children were recruited through a subject pool of families willing to participate in research projects at the University of California, San Diego.

Training Condition

Each of the children with autism participated in a symbolic play training program designed to teach symbolic play using PRT. The primary target behaviors of the intervention were symbolic play and play complexity. According to our definition, play was considered symbolic if the child substituted one object for another (e.g., pretending a block is a cookie), attributed properties to an object that it did not have (e.g., pretending a toy stove is hot) or using absent objects (i.e., pantomime) (Baron-Cohen, 1987; Ungerer & Sigman, 1981). Using miniature objects in their intended manner (functional play) was not scored as symbolic play. Play was considered complex if the child performed a sequence of at least 3 actions related to the same pretend theme. For example, putting a doll in a car, driving the car to the 'store', and pretending the doll buys food. Symbolic play and symbolic play complexity were the only behaviors targeted during this intervention.

The training program involved using PRT to teach symbolic play. The specific steps used to increase motivation included shared control, frequent variation of stimuli, modeling appropriate behavior, reinforcing attempts at correct responding, and interspersing maintenance tasks the child had already mastered. Specific scripts were not taught, rather a broad range of play activities were modeled (multiple exemplars) based on the child's choice of play stimuli in order to improve motivation and encourage spontaneity and creativity in the children. Complete descriptions of PRT can be found elsewhere (Koegel et al., 1987; Schreibman & Koegel, 2005; Koegel, Koegel, Harrower, & Carter, 1999). Adaptations of PRT used to improve symbolic play specifically, examples of the training sequence and a list of stimuli used during training can be found in Stahmer (1995).

Stimulus Tapes

Each of the children was videotaped in a clinic setting with the same adult (first author) and stimulus toys before and after symbolic play training. Typically developing children were filmed at equivalent time periods in the identical situations, but did not receive any training. These tapes consisted of 7-min segments of the child and the same adult (first author) interacting in play with a variety of toys at each time period.

Stimulus tapes used to obtain social validation ratings were prepared from randomly selected 5-min segments of these tapes. Three stimulus tapes were constructed, each of which included two segments of children with autism before play training; two segments of different children with autism after play training; and two segments of typically developing children. Using three stimulus tapes allowed observers to rate each of the children involved in the training under all conditions. The order of the segments was randomly determined by placing each child's name on a piece of paper, placing the papers in each of three boxes (pre-treatment, post treatment and typical) and randomly selecting two names for each tape from each box. If the same child with autism was chosen for pre and post tapes, a new name was drawn for one of the segments. Each tape was prepared in the order the children's names were drawn. Judges were uninformed as to the condition of each of the children.

Rating Measures

The naïve judges (undergraduate students) assessed the children's play abilities using a 6-point Likert type rating scale developed by the authors. The scales were adapted from similar scales used by Schreibman, Kaneko and Koegel (1991) and Koegel & Egel (1979). Judges assessed: (1) the child's overall play ability; (2) the amount of creativity and spontaneity exhibited in the child's play; (3) the amount of enjoyment displayed by the child; (4) the child's interaction skills; and (5) the complexity of

the child's play. These particular behaviors were chosen because they paralleled the types of behaviors scored with objective measures. The scales ranged from negative (0 and 1) to neutral (2 and 3) to positive (4 and 5). Appendix 1 presents the rating scale used in the investigation, along with the descriptors for the range of each type of play behavior.

In order to ensure that our rating scale would discriminate differences in subjective impressions of play and interaction skills we conducted a field test of the instrument. First, we assembled an introductory tape comprised of three 30-sec segments of children's play. The segments chosen were clear and distinct examples of a child displaying positive, negative or neutral ability on each measure of the rating scale. The purpose of this introductory tape was to acquaint the judges with the types of play they would be evaluating and to establish a reference range (see Schreibman et al., 1991). This introductory tape was shown to a group of 125 naïve judges who then used the rating scale to rate five 1-min segments of different children's play. The children used in this tape were some of the children who participated in the study. Examination of the resulting data indicated that judges distributed their responses across the entire range of the scale and that there was a high degree of reliability between the judges in their assessment of any given tape segments. None of the judges who viewed the pilot tapes participated in the actual study.

Procedure

Each of the three stimulus tapes was rated by a total of 21 judges. The experimenter for each of the sessions was an undergraduate honors student at the University (the third author). Prior to the presentation of the tape, judges were shown the introductory tape described above, to allow the judges to orient themselves to the task. The segment used in this "warm-up" tape consisted of three children with autism who were not on the stimulus tape.

The experimenter presented the tapes to small groups of judges (4-6 students at a time) in a living room style room. The tapes were shown on a television monitor. The judges were told only that we needed assistance rating the play behavior of certain children and that they would be viewing children interacting in play with an adult. The experimenter asked the judges to rate each segment of the tape independently.

First the introductory tape was shown, followed by a brief explanation of how each segment exemplified a particular anchor of the rating scale (e.g., excellent overall play skills). Each judge then received a play rating sheet and definitions, then the first segment of the stimulus tape was presented. Following completion of the segment, judges were given approximately 2-min to assess play behavior using the rating sheet. The sheets were then collected and new rating sheets distributed. Judges were not permitted to interact at all during the session, nor were they aware of each others ratings. The remaining segments were presented and rated in the same manner. Following presentation of all the segments subjects were debriefed as to the purpose of the study, including a brief description of Autistic Disorder and the nature of symbolic play in this population.

Results

Qualitative ratings of symbolic play

Comparisons between the ratings of play behaviors of children with autism before and after treatment and between the children with autism and typically developing children were made using a one-way multivariate analysis of variance (MANOVA). The MANOVA for three conditions (autism pre-

training, autism post-training, typical) across five primary scales (Overall Play Ability, Creativity, Enjoyment, Social Interaction, Play Complexity) yielded a significant effect for condition ($F [2,375] = 15.26, p < .01$).

These data were subsequently analyzed using follow-up one way analyses of variance (ANOVA) for each scale. Significant results were obtained for each of the individual scales: Overall Play Ability ($F [2,375] = 59.20, p < .01$); Creativity ($F [2,375] = 51.17, p < .01$); Enjoyment ($F [2,375] = 62.18, p < .01$); Social Interaction ($F [2,375] = 71.82, p < .01$); and Play Complexity ($F [2,375] = 33.26, p < .01$). To assess differences between individual groups, Tukey HSD tests ($p < .05$) were performed. For each scale, judges rated the children with autism significantly higher after training than before training. Judges also rated the typically developing children significantly higher than the children with autism at both time periods (See Figure 1). Typical children received the highest scores for overall play ability ($M = 3.69$), followed by the children with autism after play training ($M = 2.64$), then children with autism before play training ($M = 1.94$). Similar trends are seen for each scale with children with autism rated, on average, in the poor range for all but one scale before training (play complexity) and in the neutral range after play training. Typically developing children were rated, on average, as good players on each scale.

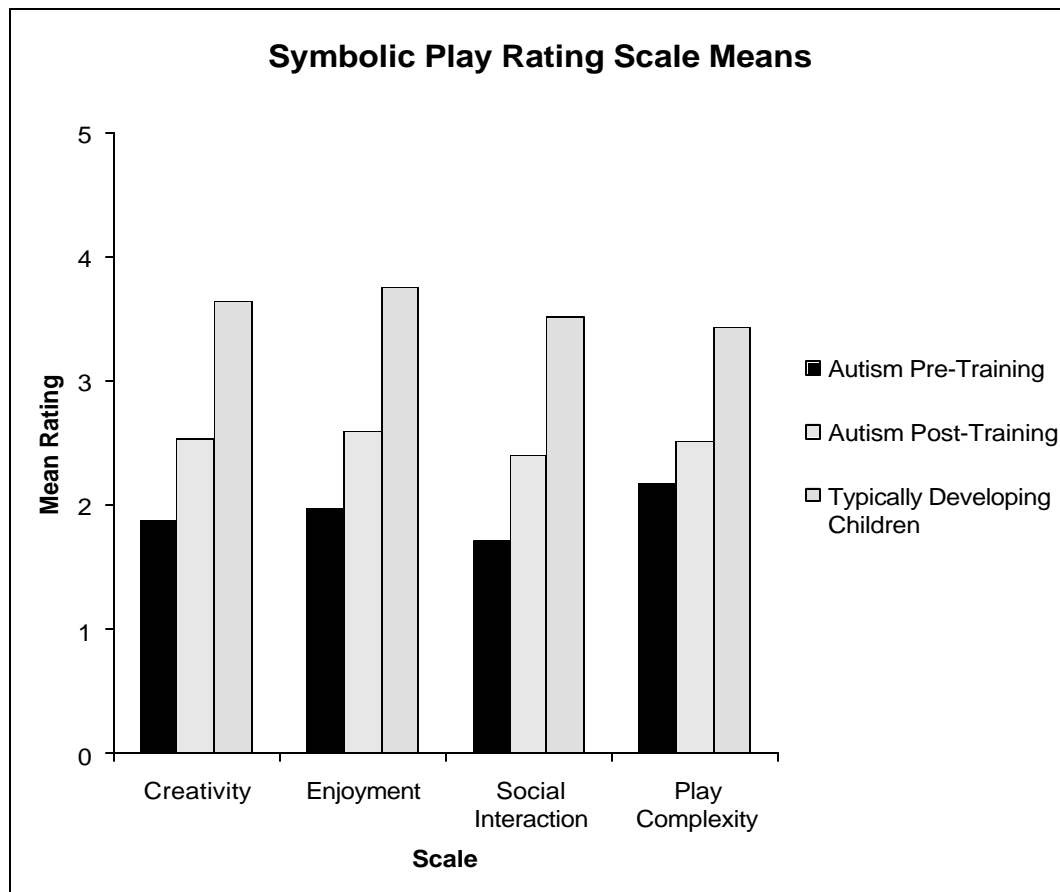


Figure 1. Mean scores on four play rating scales (Creativity, Enjoyment, Social Interaction and Play Complexity) for children with autism before symbolic play training (black bars), after training (striped bars) and for typically developing children (gray bars). Standard error for scale scores ranged from .099 to .126.

We also wished to examine the changes in subjective play ratings from pre to post training for each child with autism individually (see Figure 2). Three of the six children’s play improved substantially (i.e., children Brian, Alex and David) according to the judges. One child (Abe) improved slightly, but was already rated as playing well before training began. The remaining two children were rated, on average, at the same level at both time periods. Of the three children who received improved ratings after training, two scored in a range similar to the typically developing children (mean post training scores = 3.38, typical children’s mean score = 3.69). Abe also received a score approaching the mean of the typically developing children, however this was also true before training. Order effects were not specifically analyzed.

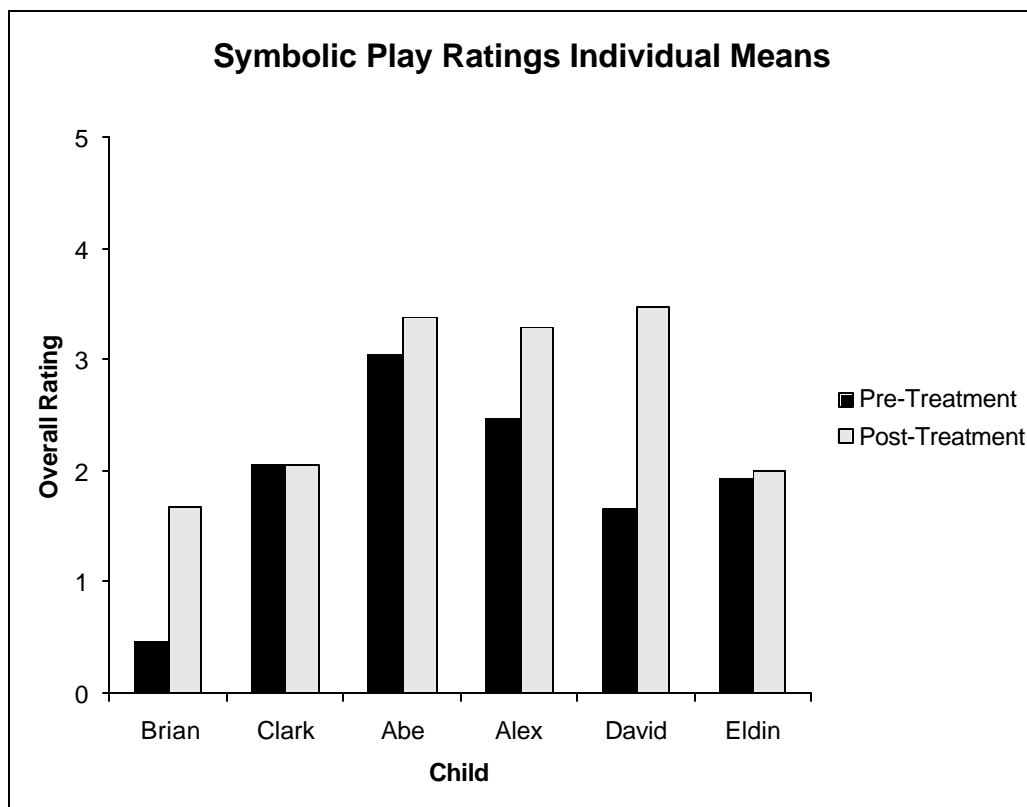


Figure 2. Mean overall play rating from each child with autism before symbolic play training (black bars) and after training (striped bars). The standard error for overall play scores ranged from .112-.293.

Comparison with Quantitative Ratings

Table 1 provides a comparison of the quantitative data from Stahmer, 1995. The children with autism had very low levels of both symbolic and complex play before intervention. After intervention the proportion of their play, on average, which was symbolic and complex was very similar to that of the typically developing comparison group.

Table 1

Mean Proportion of Symbolic and Complex Play for Children with Autism and Typically Developing Children by Time Period (Stahmer, 1995)

% of intervals	Time Period			
	Symbolic Play		Play Complexity	
	Pre Treatment	Post Treatment	Pre Treatment	Post Treatment
Children with Autism	16.9	53.5	4.3	52
Typically Developing Children	43.7	42.5	42.9	45.4

The average symbolic play of the individual children with autism is depicted in Table 2. All of the children engaged in symbolic play during, at most, 10% of intervals before intervention began. Even children who received high ratings from the judges for their pre-treatment play (Abe and Alex) had very little symbolic play on the objective measures. After intervention there was more variation in the level of symbolic play. The two children rated most poorly by the judges (Brian and Eldin) engaged in the least amount of symbolic play after PRT. The three children with the highest rating by the judges (Abe, Alex and David) had the highest level of symbolic play after PRT, however Clark had similar quantitative levels (48%) but did not receive high ratings from the judges. Average ratings of play complexity were not available, however examination of the multiple baseline graphs in Stahmer, 1995 illustrate that play complexity mirrored levels of symbolic play in most cases.

Table 2

Mean Proportion of Symbolic Play for Individual Children with Autism by Time Period from Stahmer (1995).

	Time Period	
	Symbolic Play	
	Pre Treatment % of Intervals	Post Treatment % of Intervals
Brian	2	31
Clark	7	48
Abe	10	70
Alex	8	52
David	7	50
Eldin	5	42

Discussion

The results of the present investigation indicate that naïve judges: (1) detected differences in the play behaviors of typically developing children and children with autism at both time periods (2) differentiated between the play of children with autism before and after symbolic play training, and (3) evaluated the play of children with autism more positively after play training than before play training. These results demonstrate that changes affected by PRT symbolic play training are evident and meaningful to the naïve observer. The implementation of PRT for teaching symbolic play can thus be regarded as having a significant positive effect on the play ability of children with autism not only objectively, but also qualitatively. As the beneficial effects of teaching symbolic play using PRT have been demonstrated through quantitative measures (Stahmer, 1995), the present study lends additional support to the use of this method for improving the quality of play of children who participated in the program.

The objectively obtained results from the previous investigation were supported by the qualitative assessments in several areas. Stahmer (1995) found that the children with autism engaged in more symbolic play per session after symbolic play training than before. These improvements were corroborated by the higher ratings given by naïve observers to children with autism after training. The same trend occurred for assessments of play complexity. Objective results from Stahmer (1995) indicated that children with autism increased the amount of time they spent in complex play actions following training. Likewise, subjective evaluations of play complexity were higher for the post-training group than for the pre-training group. The level of the qualitative ratings was relatively higher for children with more symbolic play than for those who engaged in fewer symbolic play actions. In addition, the children with autism appeared to enjoy playing more after the intervention and were more creative in their play. These variables would be very difficult to measure using standard objective assessment techniques.

Two discrepancies between the objective and subjective evaluations of the play of children with autism were apparent. First, the judges had a great deal of variability in their ratings of the children with autism before intervention. The objective ratings, however, indicated that all of the children had very similar, low rates of symbolic play before treatment. It is possible that the children who were rated as more appropriate before treatment had more advanced functional play (i.e., appropriate play with miniature objects) and/or fewer inappropriate behaviors. Because the judges were not provided with a definition of symbolic play but were rating overall play skills all appropriate play would have been rated.

A second discrepancy arose after intervention when comparisons to the typically developing children were made. Quantitative measures indicated that, following intervention, children with autism engaged in levels symbolic play (in terms of number of symbolic actions and complexity of play) equivalent to those of typically developing children. Thus, the symbolic play of children with autism after the PRT was not distinguishable from that of language-age matched typically developing children when quantitative measures were used. However, in the present study, significant differences were found between the two groups of children. Naïve judges gave lower ratings to children with autism even after intervention. These results suggest that while the quantity of symbolic play of children with autism improved to typical levels, the quality of their play remained deficient. Further research is needed to identify the specific behaviors differentiating children with autism from their typical peers. In other words, teaching symbolic play actions and complexity is not enough to ensure typical play behavior. Methods must be developed which also foster creativity and enjoyment of play. (National Research Council, 2001).

According to the judges, even after intervention the autism group did not play as well as typical children, however their scores did come closer to typical levels after training. Three of the six children

made noticeable improvements in overall play ability were rated similarly to the typically developing group. Additional research with larger groups of children could examine the specific pre-treatment factors that may have led to greater success for some children. Additionally, closer examination of the concurrent language and social behaviors of the three children who appeared most typical might assist with the development of new intervention techniques. It is possible that the children rated as better players by the judges engaged in more complex language or were more interactive than the children who did not make qualitative progress. In fact, an examination of individual scores from Stahmer (1995) indicates that higher language scores were associated with higher play ratings, while overall cognitive scores were not. Therefore, improving expressive communication may need to occur concurrently with play training for the best results.

There are several limitations to this project, which should be addressed. First, the children with autism who participated in this project were relatively high functioning, and all of them had some language. Therefore their level of improvement may not be representative of the population of children with autism. Children with more limited ability might not respond to the intervention in a similar manner. Second, children who begin this type of program at a younger age might have an improved response to intervention on both qualitative and quantitative measures (National Research Council, 2001). Third, neither the present study nor Stahmer (1995) compared PRT with other approaches for teaching play skills. Therefore, it is possible that other approaches may have the same, or better, qualitative and quantitative results when used to teach symbolic play. Finally, given the contemporary move toward mainstreaming children with disabilities into regular classroom settings, the ratings of individuals in the school community is important. A future study might use the children's peers or teachers in addition to college undergraduates to assess play ability (e.g., Runco & Schreibman, 1988 (Foster & Mash, 1999)).

Even with these limitations the results clearly suggest that it is possible to affect qualitative changes in the play behavior of children with autism that are apparent to the public. If children are viewed as more typical, they are more likely to be treated as such. This could allow children with autism-increased opportunities for social interaction. Although the ratings of undergraduate judges may not reflect the opinions of teachers, parents or peers, they do represent the lay community and it is often this community that stigmatizes children with autism. In fact, research indicates that parents of these children feel restricted in terms of their ability to engage in activities outside the home (Koegel, Schreibman, L., Johnson, O'Neill, & Dunlap, 1984) and that these restrictions cause significant stress for parents (Koegel, Koegel, & Surratt, 1992). Some of the stigma produced by limited and stereotyped play may be reduced with appropriate intervention.

References

- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders (DSM-IV)*. Washington, DC: American Psychiatric Association.
- Baron-Cohen, S. (1987). Autism and Symbolic Play. *British Journal of Developmental Psychology*, 5(2), 139-148.
- Bates, E., Thal, D., Whitesell, K., Fenson, L., et al. (1989). Integrating Language and Gesture in Infancy. *Developmental Psychology*, 25(6), 1004-1019.
- Doherty, M. B., & Rosenfeld, A. A. (1984). Play Assessment in the Differential Diagnosis of Autism and Other Causes of Severe Language Disorder. *Journal of Developmental & Behavioral Pediatrics*, 5(1), 26-29.

- Foster, S. L., & Mash, E. J. (1999). Assessing Social Validity in Clinical Treatment Research: Issues and Procedures. *Journal of Consulting and Clinical Psychology, 67*(3), 308-319.
- Gardner, M. F. (1990). *Expressive One-Word Picture Vocabulary Test*. Novato, CA: Academy Therapy Publications.
- Goldstein, H., Wickstrom, S., Hoyson, M., Jamieson, B., et al. (1988). Effects of Sociodramatic Script Training on Social and Communicative Interaction. *Education & Treatment of Children, 11*(2), 97-117.
- Gresham, F. M. (2004). Current Status and Future Directions of School-Based Behavioral Interventions. *School Psychology Review, 33*(3), 326-343.
- Gresham, F. M., Cook, C. R., Crews, S. D., & Kern, L. (2004). Social Skills Training for Children and Youth With Emotional and Behavioral Disorders: Validity Considerations and Future Directions. *Behavioral Disorders. Special Issue: Elucidating Precision and Rigor in EBD Research, 30*(1), 32-46.
- Hill, P. M., & Mccune-Nicolich, L. (1981). Pretend Play and Patterns of Cognition in Down's Syndrome Children. *Child Development, 52*(2), 611-617.
- Kasari, C., Freeman, S.F.N., & Paparella, T. (2001). Early intervention in autism: Joint attention and symbolic play. In L. M. Glidden (Ed.), *International Review of Research in Mental Retardation: Autism*. (pp. 207-237). San Diego, CA: Academic Press.
- Kazdin, A. E. (1980). Acceptability of alternative treatments for deviant child behavior. *J Appl Behav Anal, 13*(2), 259-73.
- Kendall, P. C., Marrs-Garcia, A., Nath, S. R., & Sheldrick, R. C. (1999). Normative Comparisons for the Evaluation of Clinical Significance. *Journal of Consulting and Clinical Psychology, 67*(3), 285-299.
- Kennedy, C. H. (2002). The Maintenance of Behavior Change as an Indicator of Social Validity. *Behavior Modification, 26*(5), 594-604.
- 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*(3), 174-185.
- Koegel, R. L., Schreibman, L., Good, A., Cerniglia, L., Murphy, C., & Koegel, L. K. (1989). *How to teach pivotal behaviors to children with autism: A training manual*. Santa Barbara, CA.
- Koegel, R. L., Schreibman, L., Johnson, J., O'Neill, R. E., & Dunlap, G. (1984). Collateral effects of parent training on families with autistic children. *Parent Training: Foundations of Research and Practice* (pp. 358-378). New York: Guilford.
- Koegel, R. L., Dyer, K., & Bell, L. K. (1987). The Influence of Child-Preferred Activities on Autistic Children's Social Behavior. *Journal of Applied Behavior Analysis, 20*(3), 243-252.
- Koegel, R. L., & Egel, A. L. (1979). Motivating Autistic Children. *Journal of Abnormal Psychology,*

- 88(4), 418-426.
- Koegel, R. L., Koegel, L. K., & Surratt, A. (1992). Language Intervention and Disruptive Behavior in Preschool Children With Autism. *Journal of Autism and Developmental Disorders*, 22(2), 141-153.
- Koegel, R. L., O'Dell, M. C., & Koegel, L. K. (1987). A natural language teaching paradigm for nonverbal autistic children. *Journal of Autism & Developmental Disorders*, 17(2), 187-200.
- Leiter, R. G. (1979). *Leiter International Performance Scale: Instruction Manual*. Chicago, IL: Stoelting Co.
- Lewis, V., & Boucher, J. (1988). Spontaneous, Instructed and Elicited Play in Relatively Able Autistic Children. *British Journal of Developmental Psychology*, 6(4), 325-339.
- Libby, S., Powell, S., Messer, D., & Jordan, R. (1998). Spontaneous Play in Children With Autism: a Reappraisal. *Journal of Autism and Developmental Disorders*, 28(6), 487-497.
- Mccune-Nicolich, L. (1981). Toward Symbolic Functioning: Structure of Early Pretend Games and Potential Parallels With Language. *Child Development*, 52(3), 785-797.
- Nadel, J., & Peze, A. (1993). What makes immediate imitation communicative in toddlers and autistic children? In J. Nadel & L. Camaioni (Eds.), *New Perspectives in Early Communication Development* (pp. 139-156). London: Routledge.
- National Research Council. (2001). *Educating Children with Autism*. Washington, DC: National Academy Press.
- Oden, S., & Asher, S. R. (1977). Coaching Children in Social Skills for Friendship Making. *Child Development*, 48(2), 495-506.
- Rogers, S. J., & Lewis, H. (1989). An Effective Day Treatment Model for Young Children With Pervasive Developmental Disorders. *Journal of the American Academy of Child & Adolescent Psychiatry*, 28, 207-214.
- Runco, M. a., & Schreibman, L. (1987). Socially Validating Behavioral Objectives in the Treatment of Autistic Children. *Journal of Autism and Developmental Disorders*, 17(1), 141-147.
- Runco, M. a., & Schreibman, L. (1988). Children's Judgments of Autism and Social Validation of Behavior Therapy Efficacy. *Behavior Therapy*, 19(4), 565-576.
- Schreibman, L., Kaneko, W. M., & Koegel, R. L. (1991). Positive affect of parents of autistic children: A comparison across two teaching techniques. *Behavior Therapy*, 22(4), 479-490.
- Schreibman, L., & Koegel, R. L. (2005). Training for parents of children with autism: Pivotal responses, generalization, and individualization of interventions. In ED Hibbs, & PS Jensen (Eds.) *Psychosocial treatments for child and adolescent disorders: Empirically based strategies for clinical practice* (2nd ed., pp. 605-631). Washington, DC: American Psychological Association.
- Schreibman, L., Koegel, R. L., Mills, J. I., & Burke, J. C. (1981). Social Validation of Behavior Therapy

- With Autistic Children. *Behavior Therapy*, 12(5), 610-624.
- Schwartz, I. S., & Baer, D. M. (1991). Social Validity Assessments: Is Current Practice State of the Art? *Journal of Applied Behavior Analysis. Special Issue: Social Validity: Multiple Perspectives*, 24(2), 189-204.
- Sigman, M., & Ruskin, E. (1999). Continuity and change in the social competence of children with autism, Down syndrome and developmental delays. *Monographs of the Society for Research in Child Development*, 64: v-114.
- Stahmer, A. C. (1995). Teaching symbolic play skills to children with autism using pivotal response training. *J Autism Dev Disord*, 25(2), 123-141.
- Stahmer, A. C., & Ingersoll, B. (2004). Inclusive programming for toddlers with autism spectrum disorders: Outcomes from the children's toddler school. *Journal of Positive Behavior Interventions*, 6(2), 67-82.
- Stone, W. L., Lemanek, K. L., Fishel, P. T., Fernandez, M. C., & Altemeier, W. A. (1990). Play and imitation skills in the diagnosis of autism in young children. *Pediatrics*, 86(2), 267-72.
- Storey, K., & Horner, R. H. (1991). An Evaluative Review of Social Validation Research Involving Persons With Handicaps. *Journal of Special Education*, 25(3), 352-401.
- Thorp, D. M., Stahmer, A. C., & Schreibman, L. (1995). Effects of sociodramatic play training on children with autism. *J Autism Dev Disord*, 25(3), 265-82.
- Ungerer, J. A., & Sigman, M. (1981). Symbolic play and language comprehension in autistic children. *J Am Acad Child Psychiatry*, 20(2), 318-37.
- Warreyn, P., Roeyers, H., Peene, N., & De Groote, I. (2004). Do early socio-communicative abilities predict later perspective taking in autism? A 3-year follow-up study. *Journal of Cognitive and Behavioral Psychotherapies*, 4, 131-148.
- Wing, L., Gould, J., Yeates, S. R., & Brierley, L. M. (1977). Symbolic Play in Severely Mentally Retarded and in Autistic Children. *Journal of Child Psychology and Psychiatry*, 18(2), 167-178.
- Wolf, M. M. (1978). Social Validity: the Case for Subjective Measurement or How Applied Behavior Analysis Is Finding Its Heart. *Journal of Applied Behavior Analysis*, 11(2), 203-214.
- Wolfberg, P. J. (1999). *Play and Imagination in Children with Autism*. New York: Teachers College Press.

Author Note

Aubyn C. Stahmer, Laura Schreibman and Nicole Palardy Powell, Department of Psychology, University of California, San Diego.

Aubyn C. Stahmer currently also has an appointment in the Child and Adolescent Services Research Center, Children's Hospital, San Diego. Nicole Palardy Powell is currently in the Psychology Department at the University of Alabama.

This research was supported by U.S. Public Health Services Grants MH39434 (P.I. Laura Schreibman), MH28210 (P.I. Robert L. Koegel) and K01 MH65325-01 (P.I. Aubyn Stahmer) from the National Institute of Mental Health.

Author contact information:

Aubyn Stahmer
Child and Adolescent Services Research Center
Children's Hospital
3020 Children's Way
MC5033
San Diego, CA 92123

Laura Schreibman
Psychology Department
0109 University of California
La Jolla, CA 92093-0109

Nicole Palardy Powell
Psychology Department
University of Alabama
101 McMillan Blvd.
Box 870348
Tuscaloosa, AL 35487

APPENDIX A, NEXT PAGE

Appendix A: Rating Sheet

Segment Number: _____

PLEASE CIRCLE ONE NUMBER PER CATEGORY.

Overall Play Ability

Child shows little or no interest in toys and ignores or actively avoids interactant. Play is repetitive and stereotyped even if using toy functionally or child uses toys improperly.

Child responds to interactant's directions but does not initiate interactions. Actions with toys are appropriate but simplistic, and are rarely linked in a storyline.

Child is very involved with toys and interactant. Child shares ideas and makes suggestions. Play actions are creative and linked in a story line.

(negative) 0 1 2 3 4 5 (positive)

Creativity and Spontaneity

Child will play only when prompted repeatedly. Child's play is repetitive, lacks novelty and has no apparent purpose or goal.

Play is mostly limited to interactant's directions but child makes some simple play actions independently.

Child spontaneously uses toys to create and act out story lines. Child uses interactants suggestions to develop the story line.

(negative) 0 1 2 3 4 5 (positive)

Enjoyment

Child seems discontented, frustrated or bored and does not appear to be enjoying self. Child pays little attention to interactant and takes long pauses between play actions. May attempt to avoid the situation.

Child does not appear to be interested or disinterested in play. Passively accepts the situation and completes the tasks without enthusiasm.

Child smiles and laughs appropriately and seems to be enjoying self. Child is attentive, involved and cooperative.

(negative) 0 1 2 3 4 5 (positive)

Social Interaction

Child ignores or actively avoids interactant.

Child responds appropriately to interactant's requests and directions but does not initiate social contact (e.g., conversation, eye contact, sharing toys).

Reciprocal interaction between child and interactant. Child responds to interactant positively and attempts to engage interactant in play.

(negative) 0 1 2 3 4 5 (positive)

Complexity of Play

Child does not play with toys appropriately. Mouths, waves, bangs or throws toys.

Child performs short, simple play actions with toys. Play actions are rarely linked by a common theme. May substitute ambiguous objects for toys in play.

Child develops a story line context for play. Play actions with different toys are integrated into the story line. More use of ambiguous objects in play.

(negative) 0 1 2 3 4 5 (positive)
