JOURNAL OF APPLIED BEHAVIOR ANALYSIS 1997, **30,** 157–160 NUMBER 1 (SPRING 1997)

MULTIPLE PEER USE OF PIVOTAL RESPONSE TRAINING TO INCREASE SOCIAL BEHAVIORS OF CLASSMATES WITH AUTISM: RESULTS FROM TRAINED AND UNTRAINED PEERS

KAREN PIERCE AND LAURA SCHREIBMAN

UNIVERSITY OF CALIFORNIA, SAN DIEGO

Two children with autism and 8 typical peers participated in a study designed to replicate an earlier finding of successful social-skills intervention for children with autism using peer-implemented pivotal response training (PRT) and to assess the effects of using multiple peer trainers on generalization of treatment effects. During training, peers were taught PRT strategies using didactic instruction, modeling, role playing, and feedback. After treatment, children with autism engaged in increased levels of social behavior.

DESCRIPTORS: autism, generalization, social behavior, peer trainers

Extended inclusion efforts provide multiple opportunities for developing friendships and ameliorating some of the social deficits found in autism. Despite these increased opportunities for socialization, teachers often report little or no social interaction between students with autism and typical peers in inclusive environments. Although many effective social-skills interventions exist (e.g., video modeling, peer mediation), there is a gap between our ability to effect desirable peer interactions and our ability to produce generalization and maintenance of these interactions (Chandler, Lubeck, & Fowler, 1992). Treatments that utilize "loose training" techniques, such as pivotal response training (PRT; see Pierce & Schreibman, 1995), have been referred to as naturalistic interventions and include procedures that may enhance generalization. The purposes of the present study were to replicate the findings of Pierce and Schreibman suggesting that typical peers can be effective social-skills treatment agents using PRT strategies and to assess the degree of generalization across untrained peers, a limitation noted in the 1995 study.

This research was supported by USPHS Research Grants MH39434 and 28210 from the National Institute of Mental Health. Special thanks to Barbara Heider, Anette Warren, Aimee Anderson, and the exceptional students and staff at Walker Elementary School in San Diego.

Address correspondence to Karen Pierce, Department of Psychology, University of California San Diego, La Jolla, California 92093-0109.

METHOD

Participants

Two children with autism, Derek and Stan, and 8 typical peers participated in this study. Derek and Stan were 7 and 8 years old and had nonverbal IQ scores of 76 and 50, respectively. Both children utilized some language, although typically in association with a request (e.g., "candy?"). Derek's and Stan's peer trainers (i.e., D-P1 through P3 and S-P1 through P3, respectively) were 8 years old and were from different classrooms. Two children from different classrooms served as generalization peers (i.e., D-P4 and S-P4, 8 and 9 years old, respectively) and interacted with target children at baseline, posttreatment, and follow-up without any special training.

Settings and Training Materials

Training took place during recess in the classroom for Derek and in a recreation room for Stan. The generalization setting

was a novel third-grade classroom in which probes were taken when most students were outside at recess. Training and generalization materials were 40 toys (i.e., 20 training toys and 20 generalization toys) with which two individuals could readily play (e.g., a ball and toy oven). A complete set of 20 toys was available during each training and posttreatment probe.

Dependent Measures

Dyads were videotaped during 10-min play sessions before, during, and after PRT for one or two sessions per day. The tapes were subsequently scored in continuous 10-s intervals for the following social behaviors of the target child (definitions adapted from Kohler, Strain, Maretsky, & DeCesare, 1990):

1. *Maintains interactions:* continued engagement in same verbal or nonverbal activity as peer. During intervals of peer initiations, positive responses (e.g., complying with request) were scored as maintaining interaction.

2. *Initiates conversation:* verbalizations that were not in direct response to a preceding question or that occurred at least 5 s after a preceding verbalization. For example, "the car has wheels" or " I like dogs" were scored as conversation initiations.

3. *Initiates play:* any verbal or nonverbal initiation of novel play or game. For example, handing the peer trainer a ball or saying "play cars" (while engaged with a different toy) were scored as play initiations.

Finally, generalization measures were obtained with an untrained peer, with novel stimuli, and in a nontraining environment (i.e., a nontraining classroom at the children's school).

Interobserver agreement. Interobserver agreement was calculated for 33% of all sessions for each behavior by measuring occurrences and nonoccurrences of the behavior. For *maintains interactions,* occurrence was 96% (range, 80% to 100%) and nonoccurrence was 98% (range, 92% to 100%); for *initiations* (collapsed across both play and conversation), occurrence was 86% (range, 64% to 100%) and nonoccurrence was 97% (range, 90% to 100%).

Experimental Design and Conditions

A multiple baseline design was used across peer trainers, and was replicated across the 2 participants. During baseline probes, training or generalization toys were placed in the middle of the room and the dyad (child with autism and typical peer) were told to "play together." No other instructions or prompts were given. Baseline probes were conducted in the training setting, in a generalization setting, with a generalization peer, and with generalization toys. Baseline probes extended across several weeks for D-P1 and S-P1, over 1 month for D-P2 and S-P2, and over 2 months for D-P3 and S-P3. Each peer was taught PRT strategies according to multiple baseline design protocol. That is, P1 remained in baseline until the target behavior was relatively stable, after which he or she was taught PRT strategies. P2 remained in baseline until changes in target behaviors were noted with P1, after which he or she was taught PRT strategies. Finally, P3 remained in baseline until changes in target behaviors were noted with the second peer trainer (see Pierce & Schreibman, 1995, for complete description of peer training). Posttreatment probes were identical to those used at baseline and included generalization probes. A 2-month follow-up assessment was conducted in both training and generalization settings.

RESULTS AND DISCUSSION

Results from this study replicated those of earlier findings by suggesting that naturalistic interventions such as PRT are effective in producing positive changes in the social be-

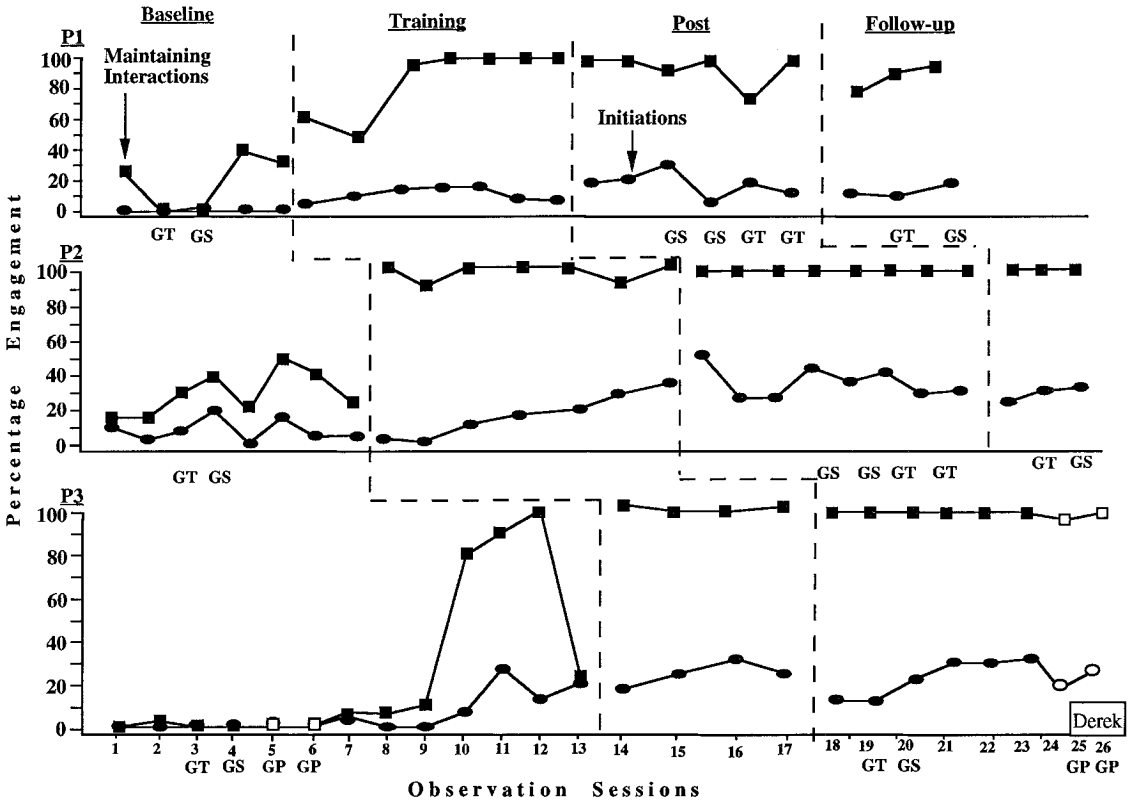

Figure 1. Percentage engagement in maintaining interactions and initiations during 10-min observations at baseline, during PRT, after PRT, and at a 2-month follow-up for Derek. Play and conversation initiations were collapsed for clarity of presentation. "GS," "GT," and "GP" represent probes taken in a generalization setting, with generalization toys, and with a generalization peer, respectively.

havior of children with autism. Derek and Stan both engaged in low levels of initiations at baseline, averaging 7% and 4%, respectively. At posttreatment, however, initiations increased with all peer trainers, averaging 19% and 16% for Derek and Stan, respectively. Maintaining interactions were variable at baseline for both participants but reached 100% at posttreatment.

One of the most important issues for social skills researchers is how to promote generalization. Pierce and Schreibman (1995) noted some limitations with generalization across untrained peers. However, in that study, each target child had only one peer trainer. Results from the current study suggest that utilizing multiple peer trainers may enhance generalization. Interestingly for Derek, not only did his social behavior increase in the presence of an untrained peer (D-P4), but he also showed evidence of generalization with D-P3. Specifically, little or no social interaction occurred with D-P3 during the first few weeks of baseline. However, after D-P1 and D-P2 had learned PRT strategies and began to implement treatment, Derek began to increase his social interaction substantially with the D-P3, reaching interaction levels above 80%. In addition, both children engaged in their newly learned social skills with generalization peers (S-P4 and D-P4). At baseline, interactions between target children and generalization peers were near zero, whereas after treatment, interactions reached levels of 100%. In theory, the only variable that changed from baseline to

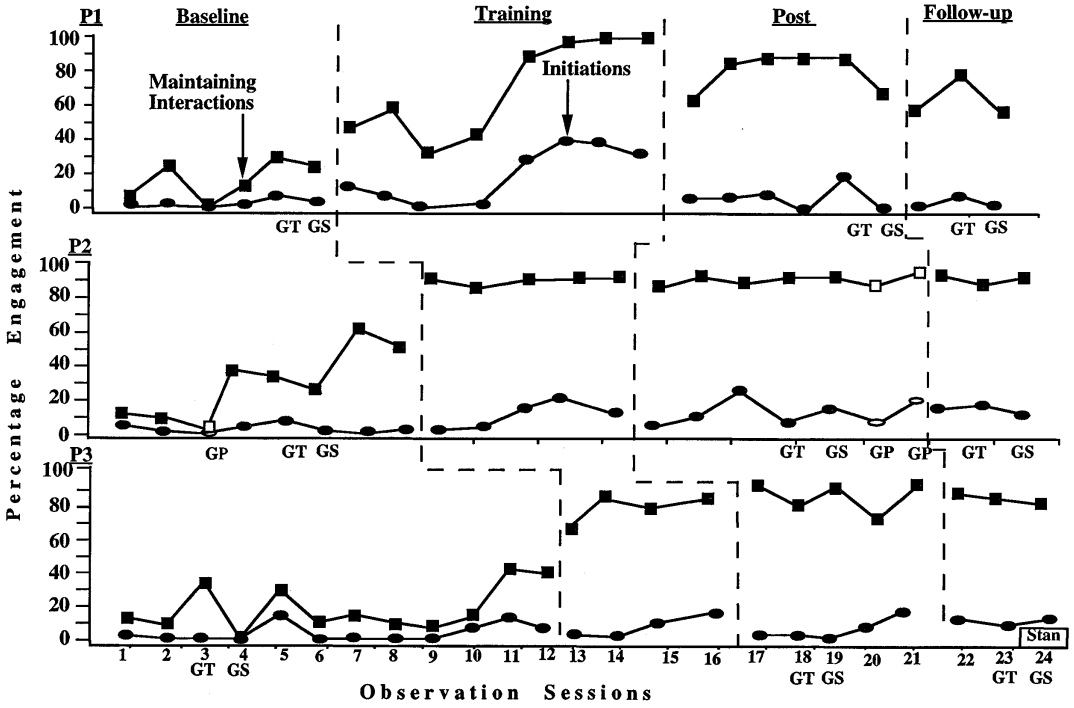

Figure 2. Percentage engagement in maintaining interactions and initiations during 10-min observations at baseline, during PRT, after PRT, and at a 2-month follow-up for Stan. Play and conversation initiations were collapsed for clarity of presentation. "GS," "GT," and "GP" represent probes taken in a generalization setting, with generalization toys, and with a generalization peer, respectively.

posttreatment (and thus accounted for changes in social interaction) was the behavior of the target children. In addition, changes in social behavior generalized to a novel setting and novel training stimuli.

The present results should be interpreted in light of the study's limitations, including some moderately unstable baselines, a limited number of untrained peer probes, and the absence of integrity data. It also appears that interactions increased during baseline between Stan and S-P2. Overall, however, the importance of these and previous findings is that in the school setting, where most adults are busy with multiple activities, the use of peer trainers is a viable and potentially effective option.

REFERENCES

Chandler, L. K., Lubeck, R. C., & Fowler, S. A. (1992). Generalization and maintenance of preschool children's social skills: A critical review and analysis. *Journal of Applied Behavior Analysis, 25,* 415–428.

Kohler, F. W., Strain, P. S., Maretsky, S., & DeCesare, L. (1990). Promoting positive and supportive interactions between preschoolers: An analysis of group oriented contingencies. *Journal of Early Intervention, 14,* 327–341.

Pierce, K., & Schreibman, L. (1995). Increasing complex play in children with autism via peer-implemented pivotal response training. *Journal of Applied Behavior Analysis, 28,* 285–295.

Received April 29, 1996
Initial editorial decision June 13, 1996
Final acceptance September 30, 1996
Action Editor, Patrick C. Friman