

TRAINING INTERACTIONAL BEHAVIORS OF ADULTS WITH DEVELOPMENTAL DISABILITIES: A SYSTEMATIC REPLICATION AND EXTENSION

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This study was a replication and extension of research by Foxx, McMorro, Bittle, and Ness (1986) that assessed generalization effects of a social skills training program on the interactional behavior of adults with developmental disabilities. Target skills were a verbal action or reaction in six skill areas that specifically addressed the participants' skill deficits. In the present study, we trained 5 adult residents of a group home across these six skill areas using the "Sorry" game format and the scoring criteria described by Foxx et al. We extended the results of Foxx et al. by (a) using pretreatment assessment procedures to identify participants' specific skill deficits, (b) training all residents in the natural environment, (c) training participant-participant interactions, (d) training participants to respond to four of the six skill areas through the use of a role-play procedure, and (e) omitting rewards, criterion levels, and self-monitoring. Additionally, the trainer in the present study modeled correct responses only as an error correction procedure during training. Similar to those of Foxx et al., our results indicated that all participants increased their use of the trained interactional behaviors during the generalization assessments in the presence of other trained peers.

DESCRIPTORS: descriptive analysis, social skills, interactional behaviors, developmental disabilities

A program developed by Foxx, McMorro, and Schloss (1983) has been effective for teaching social interactional behaviors to adults with developmental disabilities in institutional, vocational, and large community-based settings. Results of the 1983 study, as well as replications by Foxx, McMorro, and Mennemeier (1984) and Foxx, McMorro, Bittle, and Ness (1986), indicated that the program promotes acquisition and generalization of interactional skills. Additionally, follow-up data (Foxx & McMorro, 1985) showed that the participants displayed continued improvement in the use of these skills when observed 18 months after the

completion of training. Briefly, the program developed by Foxx et al. (1983) taught six skill areas (compliments, social interactions, politeness, criticism, social confrontation, and questions/answers) using the table game, "Sorry," and a specially designed card deck. A specific skill area was represented on each card, which prompted either an actor or a reactor response. The training package included trainer participation (i.e., modeling), descriptive feedback, self-monitoring, and individualized reinforcers and criterion levels.

In addition to evaluating the acquisition of social interactional behavior during training, Foxx et al. (1986) assessed the generality of treatment effects in different settings and with untrained peers. The generalization assessments consisted of natural observations in two conditions: one with trained participants only and one with the trained participants plus untrained peers. Despite initially encouraging

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results, questions concerning the effectiveness of the training procedures for producing generalized treatment effects remain unanswered. Foxx *et al.* reported that generalization of the target behaviors was not observed until 5 weeks after training was initiated. This delay of generalization prevented the isolation of a functional relation between training and the generalized social interactions. Foxx *et al.* also reported that the participants used the skills more consistently during certain stimulus conditions (i.e., during the game situation when interacting with the trainer and during probes when interacting with trained peers) than others (i.e., during probes with untrained peers). Based on these findings, the authors suggested that, in future applications, the training procedures should approximate those interactional situations in which the trained skills are most likely to be performed. This would entail training all peers in the immediate environment to facilitate a generalized treatment effect in the participants' natural environment.

The goal of our study was to refine and expand the training procedures used by Foxx *et al.* (1986) to facilitate generalization across time and settings. In the present study, we trained social interactions across the six skill areas using the "Sorry" game format and the scoring criteria described by Foxx *et al.* Our procedures differed from those of Foxx *et al.* as follows: (a) a pretraining assessment procedure was used to identify the participants' specific skill deficits and to identify the most frequently occurring interactional situations in the participants' natural environment (Kirby & Bickel, 1988); (b) all residents in the generalization (natural) environment were trained; (c) the training used a participant-participant dyad to program generalization through common stimuli (Stokes & Baer, 1977); and (d) the participants were required to role play the actor and reactor responses for four of the six categories.

To approximate the most naturally occurring conditions, participants performed as many of the social situations as possible (i.e., role playing). During the social skills training, we placed props in close proximity to the training site, or we escorted the group to the room in which the social situation

occurred. For social situations involving criticism and social confrontation, the participants were instructed to "pretend" that a situation was occurring.

The procedures that differed from the Foxx *et al.* (1986) study enabled us to evaluate the effects of identifying relevant social situations prior to treatment, to train all peers in the natural environment, and to train participant-participant interactions as opposed to participant-trainer interactions, which are usually observed in applied settings. We hypothesized that these procedural differences would facilitate a more immediate demonstration of generalization.

METHOD

Participants and Setting

Five of 6 residents of a university-affiliated group home participated in the study. The 6th resident did not participate because of an unexpected illness that required an extended hospital stay. Staffing patterns consisted of two graduate students working with the 6 adults. Interactional behaviors were selected because of a continuing lack of appropriate resident-resident interactions.

The participants' daily work schedules were used to assign residents to two groups. Group 1 consisted of 3 males, ages 45, 37, and 47 years; Group 2 consisted of 1 30-year-old female and 1 35-year-old male. The respective mean raw scores from the socialization domain of the interview edition of the Vineland Adaptive Behavior Scale were 85.3 for Group 1 and 97.5 for Group 2. All participants obtained an overall standard score of less than 20, placing them in the first percentile-profound disability range on the socialization domain. Wechsler IQ scores ranged from 21 to 47 for Group 1 and 49 to 53 for Group 2. All participants spoke in complete sentences; however, a majority of their social interactions were directed to the staff and consisted of brief repetitive statements regarding activities at work.

Training sessions were conducted in the living room of the group home. Interactions between di-

rect-care staff and participants were minimal during training sessions, and resident-resident interactions and movements were unrestricted. One or two observers and up to three other residents were present during the sessions. Generalization probes were conducted in the family room, kitchen, and living room.

Data Collection

Target behaviors. The six areas of social interaction described by Foxx et al. (1986) were selected as dependent variables, including (a) compliments, (b) social interactions, (c) politeness, (d) criticism, (e) social confrontation, and (f) questions/answers. Each component consisted of an "actor" (e.g., giving a compliment) and a "reactor" (e.g., responding to a compliment) category.

The effects of the social skills training package on the target behaviors were assessed during training and generalization conditions. Scoring criteria for all dependent variables were the same as those used in Foxx et al. (1983). A correct actor response required the participant to initiate an interaction, and a correct reactor response required the participant to respond to an interaction initiated by someone else. For example, in the compliments skill component, a correct response for the actor category consisted of verbalizing a feeling or preference in the form of a compliment. A correct response in the reactor category required the participant to acknowledge the compliment and/or relate to the other person.

During training, participants' responses to the training situations were recorded as correct or incorrect according to the scoring criteria. There were a total of 48 training situations (eight situations for each of the six skill areas). The eight situations in each skill area were equally divided into the actor and reactor categories (four in each category). The order of presentation was arranged to ensure that all participants responded once to each of the 48 situations after three games for Group 1 and after two games for Group 2.

Responses during generalization probes were scored as either initiations or expansions. Each ini-

tiation or expansion was scored as either appropriate or inappropriate by assigning it to one of the six skill areas and to a speaker category (i.e., actor or reactor) and then using the scoring criteria for that area (Foxx et al., 1983). Initiations corresponded to the actor category and expansions corresponded to the reactor category used during training. (The terms *initiations* and *expansions* were used because they more closely described the participants' responding during generalization conditions.) Additional scoring rules included (a) excluding any staff/participant interactions, (b) scoring any interruption of an ongoing interaction as inappropriate, and (c) scoring any previously used initiation or expansion as inappropriate. Generalization probes were conducted prior to, during, and after social skills training was completed. No training occurred on days when generalization probes were scheduled. The participants' initiations and expansions were recorded using a frequency count of all responses made during continuous 10-s intervals. Generalization probes lasted 10 min.

Interobserver agreement. A second observer independently collected data from a position no closer than 2.5 m from the primary observer during an average of 34% of the sessions across all phases and conditions of the experiment. For the training data, occurrence agreement was calculated on a trial-by-trial basis. Mean occurrence agreement across participants for the training data was 95% (range, 92% to 98%). For the generalization probes, total occurrence and nonoccurrence agreements were calculated on a point-by-point basis for appropriate and inappropriate initiations and expansions. Agreement percentages averaged above 82% (83% to 98%) for all dependent measures and participants.

Experimental Design

The effects of training were assessed using a multiple baseline design across groups. Each participant was provided three trials for each of the 48 social situations, after which follow-up probes were conducted for a period of 6 weeks for Group 1 and 3 weeks for Group 2.

Procedure

Assessment. To select relevant social situations, we conducted a three-stage assessment that involved reviews of individualized habilitation plans (IHP), direct-care staff interviews, and direct observations. Each participant's IHP contained objectives to increase appropriate social contacts and appropriate turn-taking interactional behavior between residents. These IHP objectives were the basis for selecting appropriate initiations and expansions as the primary dependent variables.

Ten direct-care staff members from the participants' residential setting were interviewed and asked to list the most frequently occurring inappropriate social behaviors (e.g., wearing another resident's clothing without permission) and situations for appropriate social behavior (e.g., when Tim showed a resident his new book). All staff responses were summed to determine the most frequently occurring problem behaviors and situations for appropriate interactions. These staff citations were used to identify the target behaviors for the direct observations.

A series of 10 1-hr observations was conducted at the residential setting. The observations varied randomly during the hours of 3 p.m. to 9 p.m. The data were collapsed across participants and were recorded during continuous 10-s intervals using an event-response-event recording procedure (Bijou, Peterson, & Ault, 1968). The data collector(s) recorded the inappropriate behavior or the situation for appropriate behavior, the resident's response, and the subsequent event. For example, Ed was wearing Tim's shirt (recorded as the antecedent interactional situation), Tim approached Ed and verbally threatened Ed (recorded as resident's response), followed by a staff member resolving the dispute (recorded as subsequent event). From these data, the 24 situations that occurred most frequently were selected for use during this study. The 24 situations were then assigned to one of the six social interactional areas used in the Foxx *et al.* (1986) study.

Baseline probes. No training games were played during baseline probes. Probes were begun after

the data collector suggested to a group to gather and relax for a few minutes and all participants were in the selected room. No other instructions or feedback were provided to the participants. During the probe sessions, the data collector(s) sat with a book as if he or she were doing paperwork. When a participant directed an appropriate comment to the data collector, he or she responded with a brief statement to the participant and also stated that he or she was busy and could not talk at that time. The data collector(s) ignored all inappropriate comments. Settings for the probes were determined by the availability of the designated rooms.

Social skills training. The training program contained a special set of 48 cards each containing a different social situation. The cards were introduced through the "Sorry" table game (Parker Brothers, Salem, Massachusetts). The trainer read a card prior to each participant's turn. The participants were required to respond to one another through a role-playing procedure with one participant as the actor and the next participant as the reactor. The trainer provided specific verbal feedback for incorrect answers ("That's wrong"), repeated the situation, and provided the correct answer. For correct answers, the trainer stated, "Good answer." All participants received snacks noncontingently after the game. Training games lasted approximately 45 min.

Our training procedures differed specifically from those used by Foxx *et al.* (1986) in that we used a role-playing procedure to train the participants to respond to one another as opposed to participant-trainer responding. In addition, trainer participation (i.e., modeling), self-monitoring, individualized reinforcers, and individualized performance criterion levels were not used in the present study.

Generalization probes. The generalization probes were conducted in the same manner as baseline probes. During training, generalization probes were conducted once per week after one complete training series (i.e., all 48 social situations were trained) for a group. Follow-up probes were conducted after social skills training was completed for the respective groups.

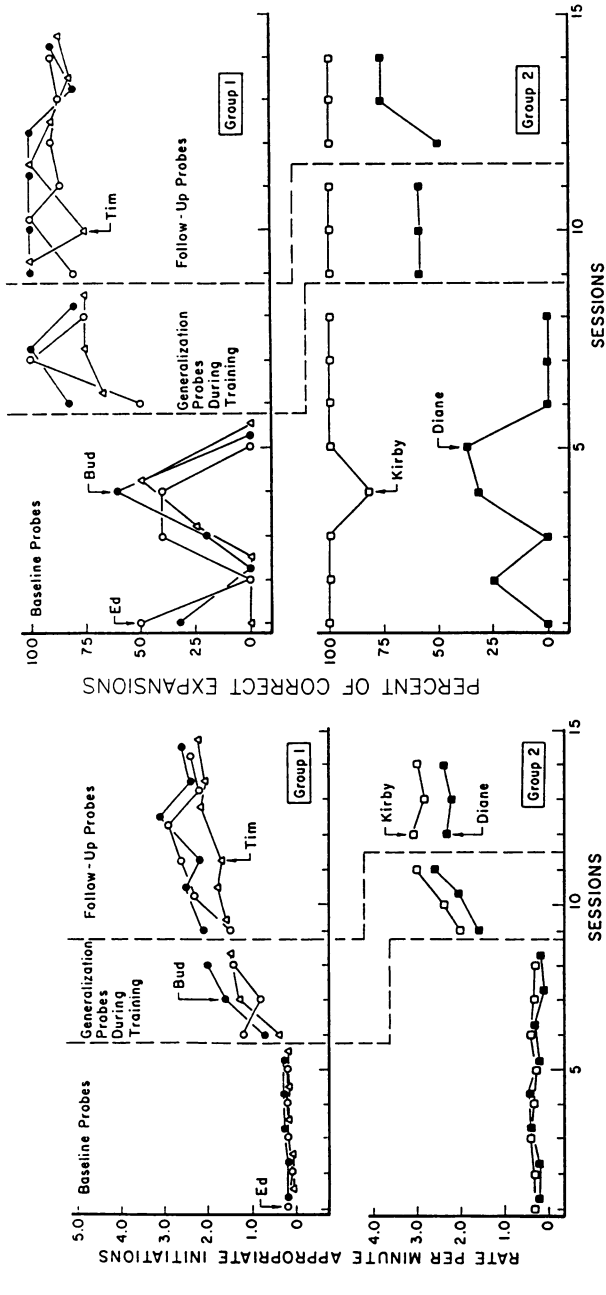


Figure 1. Rate of appropriate initiations for Group 1 and Group 2 (left graphs) and the percentage of correct expansions for Group 1 and Group 2 (right graphs).

Social validation. Direct-care staff completed the Vineland Adaptive Behavior Scale after follow-up probes to measure the social validity of the skill acquisition. The rating scale was administered approximately 4 months after the last follow-up probe.

RESULTS

Appropriate initiations and correct expansions are presented in Figure 1 for both groups. Of the inappropriate interactions recorded, only inappropriate expansions occurred at a high frequency; these are reflected in the expansion data presented in Figure 1. The data for appropriate initiations showed that, during baseline probes, the participants in Groups 1 and 2 averaged 0.2 and 0.3 appropriate initiations per minute, respectively. Results of the generalization probes conducted during the training conditions showed an improvement in each group's appropriate initiations to an average rate of 1.2 for Group 1 and 2.3 for Group 2. All participants continued to improve their appropriate initiations during follow-up probes. The average rate of appropriate initiations was 2.2 and 2.7 for Groups 1 and 2, respectively.

The expansion data indicated that participants in Group 1 averaged 24% correct expansions; Diane (Group 2) averaged 15% correct expansions per session during baseline probes. Kirby (Group 2) consistently expanded correctly to an initiation with the exception of Probe Session 4, in which he responded correctly to 86% of the initiations. His data are reported in Figure 1, but, because of his skill level, increasing his percentage of correct expansions was not a training goal. Each participant increased his or her number of correct expansions for the generalization probes during training conditions. Participants in Group 1 averaged 78% correct expansions. Diane averaged 57% correct. Improvement continued for all participants on correct expansions during the follow-up probes. The percentage of correct expansions increased to an average of 90% for Group 1 and 68% for Diane in Group 2.

All 5 participants' mean number of correct responses to the training game situations increased

during successive training series. For Group 1, the smallest individual gain was 26% (Tim) and the largest individual gain was 50% (Ed) from the first training series to the completion of training. Bud had a 33% gain in mean number of correct responses. In Group 2, Kirby improved 24% and Diane improved 25%. Across participants, the mean percentage of improvement by skill category was compliments, 30%; politeness, 23%; social interaction, 17%; and questions and answers, 12%. In the criticism category, the mean percentage of correct responses for each participant in Group 1 decreased over successive training sessions from 50% to 11%. In Group 2, Diane improved from 0% correct to 75% correct, and Kirby remained at 75% correct across training sessions. The social confrontation data show that participants in Group 1 improved from a mean percentage correct of 39% to 50%; however, Diane and Kirby did not improve, averaging 25% and 75% correct, respectively, throughout training.

Direct-care staff completed the Vineland Adaptive Behavior Scale after training was completed to assess social validity. Staff members reported that each participant improved his or her overall performance on the socialization domain. The mean improvement for the participants was 19 points (range, 4 to 34). These scores indicated that 4 of the 5 participants improved a minimum of 1 standard deviation ($SD = 15$) from pretraining to posttraining.

DISCUSSION

All participants exhibited increases in their initiations and expansions. These findings are consistent with those of Foxx *et al.* (1986), who found that participants' use of the skills occurred most frequently in the presence of other trained peers. A notable difference in our study was the improvement observed in the participants' interactional behavior shortly after the introduction of training. By contrast, there was a delay of approximately 5 weeks between the introduction of training and the observation of a generalized effect of treatment in the Foxx *et al.* (1986) study.

Differences in the immediacy of a treatment effect may be a function of procedural differences between the two studies. For example, Foxx et al. (1986) reported that the participants engaged in the targeted skills primarily in the presence of trained peers or nonhandicapped individuals. The authors suggested that the frequency of these skills increased because their interactions were reinforced by individuals who exhibited similar behaviors. We addressed this possibility by training all participants in the natural environment. In addition, we trained resident-resident interactions as opposed to resident-staff interactions in order to decrease the residents' dependence on staff for attention. When staff (or peers) are unable to provide regular attention, the probability of other, possibly maladaptive, behaviors may increase (Mace & Lalli, in press).

A common limitation of social skills research has been the exclusion of matching participants' skill deficits to training priorities (Schloss, Schloss, Wood, & Kiehl, 1986). Therefore, when target behaviors were selected arbitrarily, they were rarely supported by the natural environment. Our use of the pre-treatment assessment data to select training situations and target behaviors may have contributed to the immediate generality of treatment effects observed in this study. The pretraining assessment procedure allowed us to identify 24 naturally occurring interactional situations, and a variety of response topographies associated with these situations, that our participants frequently encountered. These situations and response topographies were then presented repeatedly during the training conditions in an attempt to facilitate participant responding to naturally occurring opportunities for interaction (Kirby & Bickel, 1988). Thus, we reasoned that training skill topographies that would be reinforced in these naturally occurring interactional situations would increase the likelihood of generalization.

Several aspects of our study should be considered when interpreting the results. First, the extent to which the presence of the observers may have affected the results during the probe sessions is unknown. A second concern was the lack of change in the participants' responses to the criticism and

social confrontation situations. Interestingly, improvements were observed in the other four skill areas that employed role playing during training. Future investigations might evaluate the contribution of the role-play procedure, especially in the areas of social confrontation and criticism. In addition, the long-term effectiveness of the training package should be evaluated over a longer period (e.g., 12 to 18 months), similar to Foxx and McMorrow's (1985) follow-up assessment. Finally, the use of graduate students as direct-care staff in the participants' group home may limit the generalizability of the results across residential settings.

The findings of this study have implications for subsequent training of interactional behaviors in applied community settings. Specifically, training can be accomplished using a game format without the investment of extensive time, staff, or costly materials, and participants can engage in resident-resident interactions that may facilitate generalization by producing naturally occurring peer reinforcement. Also, specific training items can be tailored to the needs of the participants without changing the general training procedures. Finally, all individuals in the setting may be trained concurrently to assure that the natural environment will support the newly trained behaviors.

REFERENCES

- Bijou, S. W., Peterson, R. F., & Ault, M. H. (1968). A method to integrate descriptive and experimental field studies at the level of data and empirical concepts. *Journal of Applied Behavior Analysis*, *1*, 177-210.
- Foxx, R. M., & McMorrow, M. J. (1985). The use of a modified table game to teach social skills to mentally retarded adults: Follow-up results from three studies. *The Behavior Therapist*, *8*, 77-78.
- Foxx, R. M., McMorrow, M. J., Bittle, R. G., & Ness, J. (1986). An analysis of social skills generalization in two natural settings. *Journal of Applied Behavior Analysis*, *19*, 299-305.
- Foxx, R. M., McMorrow, M. J., & Mennemeier, M. (1984). Teaching social/vocational skills to retarded adults with a modified table game: An analysis of generalization. *Journal of Applied Behavior Analysis*, *17*, 343-352.
- Foxx, R. M., McMorrow, M. J., & Schloss, C. N. (1983). Stacking the deck: Teaching social skills to retarded adults with a modified table game. *Journal of Applied Behavior Analysis*, *16*, 157-170.

- Kirby, K. C., & Bickel, W. K. (1988). Toward an explicit analysis of generalization: A stimulus control interpretation. *The Behavior Analyst*, *11*, 115-129.
- Mace, F. C., & Lalli, J. S. (in press). Linking descriptive and experimental analyses in the treatment of bizarre speech. *Journal of Applied Behavior Analysis*.
- Schloss, P. J., Schloss, C. H., Wood, C. E., & Kiehl, W. S. (1986). A critical review of social skills research with behaviorally disordered students. *Behavioral Disorders*, *12*, 1-14.
- Stokes, T. F., & Baer, D. M. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis*, *10*, 349-367.

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