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PREPARATION FOR EFFECTIVE SELF-REGULATION: THE DEVELOPMENT OF GENERALIZED VERBAL CONTROL

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A correspondence training procedure was used to develop consistency between children's verbalizations and their subsequent behavior across increasingly remote settings and time. The interval of time between the verbalizations and the opportunity to engage in several target behaviors was systematically increased across four preschool settings. Probes of generalized verbal control of home behaviors were conducted throughout training and showed that generalization was obtained in the absence of any salient externally imposed contingencies after the children had reliably come under the control of verbalizations about preschool behaviors.

DESCRIPTORS: correspondence training, generalization, verbal mediation, preschool children, generalized verbal control

The functional role of children's verbalizations as mediators of behavior change has clinical and theoretical implications in the development of self-regulatory processes (Israel & Brown, 1977; Stokes & Baer, 1977; Zivin, 1979). The development of generalized verbal control (i.e., the use of self-verbalizations to control behaviors that have never been the target of training) is useful because, after initial training, behaviors may become modifiable by prompting a relevant antecedent verbalization only. Furthermore, verbalizations with antecedent controlling functions may be used by a child across settings and time and may function as mediating discriminative stimuli for behavior frequently inaccessible to external controlling agents (e.g., Baer, Williams, Osnes, & Stokes, 1984).

To date, research in correspondence training has investigated mediating verbalizations across brief periods of time or within a proximal setting (e.g., Paniagua, Stella, Holt, Baer, & Etzel, 1982). In the study reported here, we analyzed training parameters leading to antecedent verbal control of untrained behaviors remote in time and across settings, using a correspondence training strategy in which the interval between children's verbalizations and correspondence opportunities was systematically increased within the preschool. To test the development of antecedent verbalizations, home probes for generalized verbal control were conducted in the absence of programmed reinforcers for the verbalizations or the relevant behaviors.

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METHOD

Subjects and Setting

The subjects were two boys (Sean and Ed) and one girl (Jackie), aged 4 years, 2 months to 4 years, 5 months. They attended a private preschool serving both normal and developmentally disabled or behavior disordered children. Subjects were selected based on teacher reports of deficits in social or academic behaviors, systematic observation for 1 month prior to the study to confirm these reports, normal age-appropriate verbal abilities, no diagnosis of behavior disorder, no participation in correspondence training prior to this study, and parental consent.

Target Behaviors and Observations

Play observations occurred for 15 min in an 8 m × 12 m area containing toys designed to facilitate learning and development in four areas: social

(e.g., puppets), fine motor (e.g., tinker toys), gross motor (e.g., balance beam), and creativity (e.g., paints). Play behavior was scored within 10-s intervals cued by audiotape. During play, Sean and Jackie typically used a single toy. To encourage a broader range of toy play, their targets were changed daily in rotation across the toy groups. Ed demonstrated poor peer interaction: He played exclusively with one child. Ed's target behavior involved increasing appropriate peer interactions by asking specified children to play with him and playing with them.

Large group activities occurred for 15 to 20 min in a 7 m × 8 m area where children sat on carpeted mats in a semicircle. Large group was led by one staff member and consisted of a variety of activities designed for preschool age children (e.g., Peabody Language Development Kit activities). During large group, Sean typically did not sit next to anyone except for one other child. This occasionally led to aggressive behaviors (e.g., pushing other children) or delays in his being seated. Sean's target behavior required him to alternately sit next to each of several other children during group. Jackie's large group behavior was selected because of a need identified by the preschool teachers. Because sitting mats were typically thrown into a disheveled pile, mat straightening was identified by the teachers as a functional and adaptive behavior. Finally, Ed demonstrated a low frequency of hand raising to answer questions during large group relative to that of his peers. On the infrequent occasions when he raised his hand, he typically gave appropriate answers. Hand raising was targeted to increase Ed's group participation.

Home target behaviors were selected to provide subjects with additional practice in writing and fine motor activity. Home target behaviors included various letter, number, and name writing tasks, and coloring shapes of paper after cutting them. Homework was returned to school with the child the following day. Complete definitions of all target behaviors may be obtained from the first author.

Large group, play, and home behaviors were scored as occurring or not. For Ed, frequency of questions asked and hand raises were recorded. Two observers, trained to an 80% agreement criterion on all behaviors, recorded the students' target behaviors simultaneously but independently, remaining at least 2 m apart, on 27% of the days for large group, 30% for play, and at least 42% for home behavior. Interobserver reliability assessments occurred in every experimental condition. Agreements were counted when both observers recorded the behavior as meeting its defined criterion. There were no disagreements on any day for large group, play, or home behaviors. Reliability on Ed's hand raising was calculated by dividing the smaller frequency by the larger frequency recorded for questions asked and hand raises. Mean percent agreement for questions asked was 92.8% (range, 82%–100%) and for hand raises it was 90.8% (range, 55%–100%).

Procedures

Children were observed daily in four settings: 1:00 p.m. Large Group I; 1:20 p.m. Play I; 2:00 p.m. Play II; and 3:10 p.m. Large Group II. Prior to Large Group I, each child was asked by an experimenter if she or he would engage in a target behavior in one of the four preschool settings. The question was answered by verbalizing the behavior in which she or he was to engage and the setting in which it was to occur, e.g., "I'm going to raise my hand a lot today in the first large group." During the initial 3 days of verbalization conditions, children were prompted to make complete, correct statements. The experimenter asked the question, modeled the correct verbalization, and repeated the question (e.g., "So, what are you going to do in play today?"). No prompts were required after the third day for any child nor did any child ever refuse to make the verbalizations. Consequences for the verbalization varied according to the condition, as described below. Interventions were introduced in one setting at a time per child and proceeded sequentially from the setting nearest to the verbalization to the setting farthest removed in time. The interval of time between antecedent

verbalizations and the opportunity to engage in the target behaviors was systematically increased as children proceeded through training.

Home probes of generalized verbal control were conducted two to four times a week. Children were asked individually at the end of each school day if they would complete the homework assignment. They answered the question by verbalizing that they would do the task and return to school with it the following day. Consequences for the verbalization were always neutral: Only minimal consequences (i.e., "O.K.") were given for returning or failing to return the following day with the assigned task.

Parents of the children agreed to remain blind to the type of task their children were asked to perform and the days on which tasks were assigned. They were instructed not to prompt, assist, or remind the child to do the task or return to school with it the following day. Parents were asked only to supply the child with the necessary materials, i.e., pencil and paper, on request from the child. Questioning during and at the end of the study showed that parents reported giving no assistance beyond that allowed.

Experimental Conditions

Baseline. No questions or verbalizations occurred during baseline and no consequences for engaging in target behaviors were administered. Staff members refrained from praising or giving special attention to the performance of any target behavior.

Reinforcement of verbalization. Consequences were contingent only on correct, complete verbalizations made prior to opportunities to perform target behaviors. Following a correct verbalization, children were given the opportunity to pick from a number of social consequences (e.g., piggy back rides, twirls through the air, tickles.)

Correspondence training. Consequences were contingent on the children's performance of the behaviors that they said they would do. During the first few days of this condition the contingencies were stated for the child (e.g., "If you do what you say you're going to do, you'll get to pick a reward"). Only minimal verbal consequences (i.e., "All right") were provided for the verbalizations. Consequences for correspondence were identical to those for reinforcement of verbalization conditions and were provided in an adjoining office immediately following the opportunity for the target behavior to occur. When children's verbalizations did not correspond to the behavior, they were told that they could not earn a reward because "you didn't do what you said you were going to do."

Design

Within-subject multiple baseline designs were used by introducing reinforcement of verbalization sequentially across the four preschool activities. If the child's behavior did not come under the control of the reinforcement of verbalization, correspondence training was implemented. To ascertain that changes in the controlling effect of verbalizations would not have occurred with the passage of time or repeated exposure to reinforcement of verbalization, Jackie received two reinforcement of verbalization conditions prior to correspondence training. A multiple baseline design across two children, Sean and Jackie, was also used to demonstrate the causal relationship between the preschool training history and the performance of home target behaviors.

RESULTS

The data from the four preschool settings and home behaviors for Sean and Jackie are presented in Figure 1 and in Figure 2 for Ed.

Preschool behaviors. During initial baselines and reinforcement of verbalization conditions, the children did not reliably engage in target behaviors. With the introduction of correspondence training in Large Group I, all showed significant changes, meeting the criteria for correspondence between 80% and 100% of the days. Following correspondence training, reinforcement of verbalization conditions were sufficient in controlling the performance of target behaviors in Play I, Play II, and

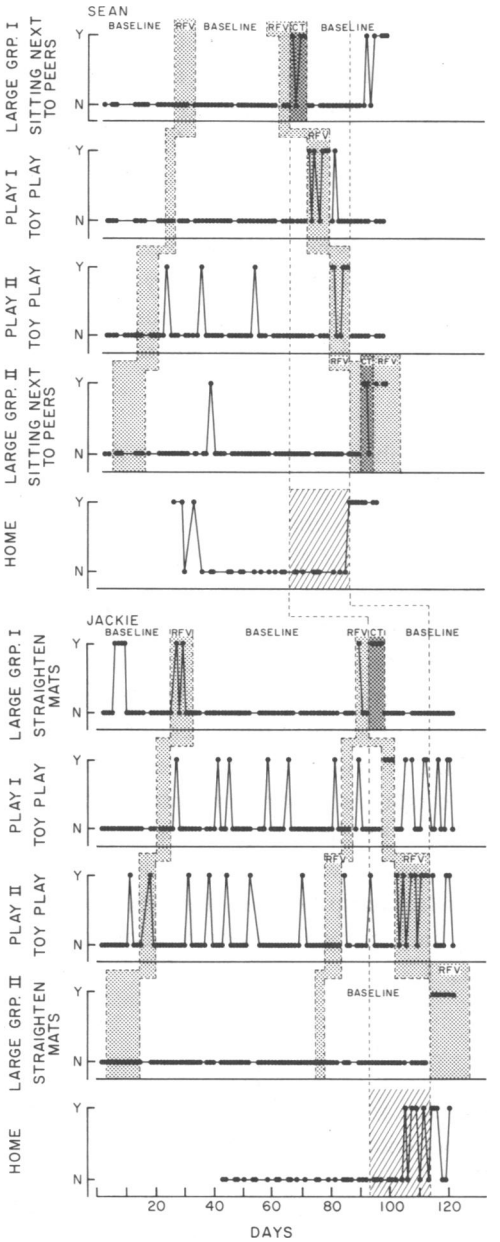

Figure 1. Within-subject multiple baseline designs across four preschool settings and home behaviors for Sean and Jackie. The multiple baseline design across subjects is also shown. The occurrence (Yes) or nonoccurrence (No) of sitting next to designated peers, playing appropriately with the designated toy for at least 60 s, neatly and promptly straightening mats, and the completion and return of homework are noted by behaviors. Broken vertical lines across subjects illustrate the preschool training history multiple baseline and is inclusive of Large Group I training through Play II reinforcement of verbalization, represented as the area with diagonal line crosshatching on the home data. Missing data indicate that no data were collected on that day.

Large Group II settings despite the absence of training in these settings. These data show the development of generalized verbal control across behaviors and to settings progressively more remote in time from the verbalization itself. Sean's Large Group II performance, however, required brief contact with correspondence training contingencies before he engaged in behaviors during reinforcement of verbalization, and Ed's target behaviors did not come under the control of reinforcement of verbalization until Large Group II. Correspondence training was required in Play I and Play II settings for Ed's play behaviors.

Home behavior. Children did not reliably engage in home behaviors until they had proceeded to training in the third or fourth preschool setting (Play II and Large Group II). The multiple baseline across subjects presented in Figure 1 demonstrates that generalized verbal control of remote home target behaviors corresponds with the sequential introduction of the preschool training history. Because children were introduced to the preschool training sequence at different points in time, the design documents the training history preceding generalized "remote" control.

DISCUSSION

This research experimentally documents a training history preceding generalized verbal control to temporally and spatially remote settings. The findings also demonstrate the utility of these procedures in modifying behaviors important to the development of young children in the preschool. Furthermore, because generalized verbal control of home behavior occurred in the absence of salient programmed contingencies, the study demonstrates a contingency history that established children's statements as functional antecedent verbalizations.

The discriminative function of statements was programmed by having verbalizations control behavior progressively more remote in time, developing generalized control under reinforcement of verbalizations, and training generalized verbal control across several stimulus (preschool settings) and response (target behaviors) exemplars (Stokes &

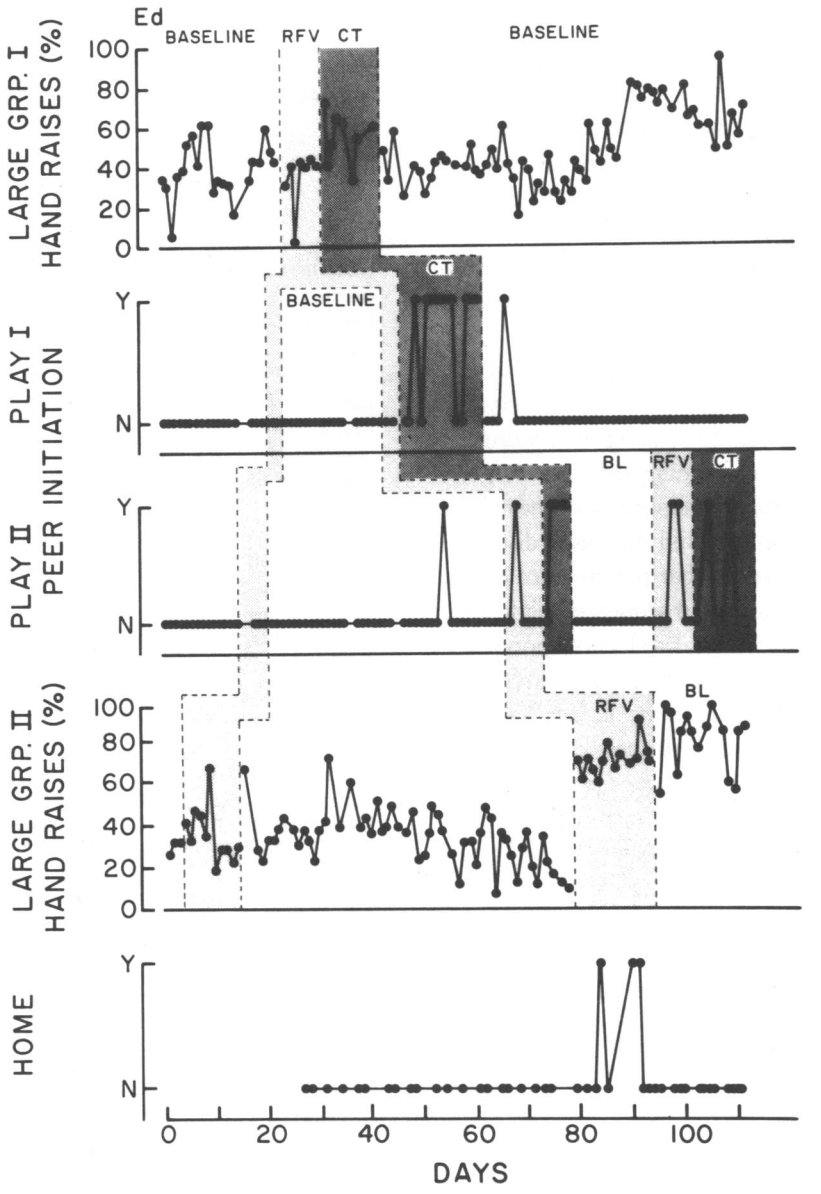

Figure 2. For Ed, the multiple baseline design across preschool settings and home behaviors. Percentage of Ed's hand raising following questions in large groups, the occurrence (Yes) or nonoccurrence (No) of Ed's asking a designated child to play and playing with the child for at least 60 s and the completion and return of homework are noted by behaviors. Missing data indicate that no data were collected on that day.

Osnes, 1986). Although the experimental design used does not allow isolation of any one training variable as critical, the three training parameters highlighted above are consistent with the performance of all three children. Future research might isolate further the training components leading to potent antecedent verbal control.

The data raise several issues for future clinical and research applications of verbal self-regulation training. Although Sean failed to engage in Large Group II behaviors during reinforcement of verbalization, for example, he was performing the more remote home behavior. Similarly, Ed never performed well under reinforcement of verbaliza-

tion of play behavior. Apparently, the presence of salient competing contingencies (e.g., peer consequences) may moderate the potency of discriminative verbal controls. In both Sean's and Ed's cases, correspondence training contingencies proved to be more effective, probably by virtue of providing potent reinforcement for these low rate behaviors. Analysis of competing contingencies may be crucial to understanding the strength of antecedent control strategies.

Future research might analyze the effects of the procedures on the development of response classes. On several occasions, simply stating the contingencies on the first day of training led to correspondence; this suggests that reinforcement of the child's verbalization may have served only as a discriminative stimulus, signaling that performance of the target behavior would be subsequently reinforced.

Furthermore, relatively brief correspondence training was effective in imparting generalized control to our subjects' verbalizations. Longer training, however, may be required with persons exhibiting major behavior problems or with developmentally handicapped children (see Whitman, Scibak, Butler, Richter, & Johnson, 1982). Finally, although important behaviors were successfully modified, maintenance programming strategies should be considered because the abrupt removal of contingencies rarely led to maintenance. It would also be interesting to examine whether maintenance following correspondence training procedures is superior to maintenance following other intervention techniques.

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