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AN EVALUATION OF STRENGTHENING PRECURSORS TO INCREASE PRESCHOOLER COMPLIANCE

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We evaluated the strategy of increasing precursors to compliance on the compliance of 2 preschool boys. Modeling and differential reinforcement were used to increase specific responses to his name being called prior to the opportunity to comply with an instruction. The precursors were stopping the ongoing activity and orienting to, making eye contact with, and saying "yes" to the instructor. High levels of precursors occurred during treatment, and increases in compliance also were observed, even though the consequences for compliance and noncompliance did not change.

Key words: compliance, precursors, preschoolers

Noncompliance exhibited by young children has been (Lin, Lawrence, & Gorrell, 2003; Schutte & Hopkins, 1970) and still is (Austin & Agar, 2005) a common teacher concern. A recent descriptive assessment of preschooler compliance found that preschoolers complied with simple instructions on only 50% of occasions during free-play periods (Stephenson & Hanley, 2010). Hanley, Heal, Ingvarsson, and Tiger (2007) suggested that strengthening precursors to compliance, such as stopping competing behavior (talking or playing), orienting towards the speaker, making eye contact, and saying "yes," may increase the likelihood of compliance. In their analysis, both precursors and compliance exhibited by preschoolers were shown to increase following a classwide program designed to develop these and other important social behaviors. One limitation was that the analysis did not allow the effects of reinforcing precursors to be observed on the probability of compliance. Hamlet, Axelrod, and Kuerschner (1984) demonstrated that increasing the probability of eye contact following an instruction resulted in a higher probability of compliance with that instruction for young children. However, compliance was still somewhat low after treatment, and eye contact was increased by teachers "demanding" it by using a firm tone and by repeatedly prompting eye contact until the instruction was completed. Strategies for promoting compliance by increasing precursor behavior without reliance on presumably aversive strategies seem warranted, because increasing these responses may have a positive effect on compliance.

In the current study, we assessed the effects of increasing the probability of multiple precursors (stopping, orienting, making eye contact, and saying "yes") via modeling and differential reinforcement on two preschoolers' levels of compliance.

METHOD

Participants and Setting

Two 5-year-old boys of typical development, Oscar and Adam, who attended different classrooms in the same community-based preschool, participated. Neither child had a psychiatric diagnosis or an educational classification, but each child was reported to comply

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only infrequently with his teacher's instructions. Each child assented daily to participating. Teacher and parental consent for participation also were obtained, and the college institutional review board approved the project. Sessions were conducted during regularly scheduled classroom activities by undergraduate students who were enrolled in a community-based applied research course.

Measurement

Using paper and pencil, two undergraduate observers simultaneously but independently recorded four precursors to compliance: *stopping* (the termination of whatever activity in which the child was engaged within 2 s of his name being called), *orienting* (the act of the child positioning his body so that he faced the person providing the instruction), *eye contact* (the act of the child's eye gaze meeting that of the individual who said his name), *saying "yes"* (the act of the child saying "yes," within 2 s of his name being called) Observers also recorded two indices of compliance: *initiating the task* (the child beginning to execute the given instruction within 3 s of issuance) and *completing the instruction* (the child completed the instruction within 60 s). The extended amount of time to complete the instruction was dictated by the teachers who expressed concerns with the short latencies originally suggested and typically found in compliance research. Two sessions were conducted per day, 2 to 4 days per week. Interobserver agreement was assessed on a trial-by-trial basis for all sessions. Mean interobserver agreement for all measures was 94% for Oscar (range, 88% to 100%) and 97% for Adam (range, 94% to 100%).

Intervention Development Process

The treatment procedures were developed in consultation with the participants' teachers, who both requested a differential reinforcement program that would avoid the use of edible items and frequent breaks and that did not require physical guidance. Thus, a token-based procedure was developed. Tokens were to be backed up by free-play time and access to child-selected activities. It also was agreed that 80% compliance with instructions was an acceptable outcome for the intervention.

Condition Descriptions

Sessions were conducted while the child was playing with other children and classroom toys. This competing reinforcement context was arranged to closely approximate situations in which a preschooler typically experiences instructions (see Stephenson & Hanley, 2010, for additional rationale). Instruction-related materials remained constant throughout the study and included paper and writing and coloring implements, action figures, blocks, and other age-appropriate toys. Children were allowed to play with any of the items for the duration of the session. Undergraduate students served as the instructors initially. During baseline, an instruction was given approximately once every 1 to 2 min during the free-play period, and sessions were terminated when 12 instructions had been delivered. The instructions were the same as those used by Stephenson and Hanley (2010; e.g., "Put the — in the box," "Zip the vest," "Give me a [color] —," "Put the — in the —") with the addition of two instructions for vocal behavior (e.g., "What color is this?" and "What is this used for?"). The instructor said the child's name, paused for 2 s, and delivered an instruction (Hamlet et al., 1984). The instruction was issued without interrupting the child's activity, touching the child, or actively making eye contact; the instructor stood at least 1 m from the child. This was the manner in which most instructions were issued in the classroom. The child received descriptive praise for emitting any of the precursor behaviors or compliance, and noncompliance was ignored (i.e., no additional prompts were provided if the child did not comply).

Treatment involved modeling and differential reinforcement of precursor behaviors. The

child received a token each time he emitted all four precursors (stopping, orienting, making eye contact, saying "yes"). The token was provided immediately after the precursor behaviors and prior to the delivery of the instruction. The child could access the back-up event (1 min of child-led play with child-selected toys per token) during the token exchange following the session. The exchange value of the token was changed to 30 s of play per token in the third treatment session. In the fifth session, the child was given the opportunity to invite a friend to play. Any precursor behaviors that were not emitted were described and modeled by the instructor, and the token was withheld unless all four precursors were emitted. As in baseline, descriptive praise followed compliance, and noncompliance was ignored.

Prior to implementing treatment, the value of the tokens was established and the precursor behaviors were taught via instructions, modeling, role playing, and differential reinforcement. Both were accomplished during three practice sessions between baseline and treatment observations. In each of the sessions, the child was told to hold out his hand, and a token was placed in it. After holding it for 5 s, the participant was asked to return the token. The instructor then said, "This buys you fun playtime. Where do you want to play, and what do you want to play with?" The child then played with the instructor for approximately 2 min with his selected toys in his selected area. This process was repeated five times.

Once the value of the tokens had been demonstrated, the instructor described the importance of the four precursor behaviors, modeled them, and asked the child to role play them when his name was called. Following modeling and role playing, practice sessions with instructions began. The child was given five practice opportunities in each session. Descriptive praise and a token were provided when the child emitted all four precursor behaviors; if any precursor behaviors were not emitted, these were described and modeled by the instructor, and the next trial was presented.

Treatment Extension

This phase was identical to treatment; however, the lead teacher in each classroom served as instructor. A 10-min training period was conducted prior to this phase. Training included a review of the treatment components and opportunities to role play the intervention.

Design

A multiple baseline design across subjects was used to determine the direct effects of modeling and differential reinforcement on precursors and the indirect effects on compliance.

RESULTS AND DISCUSSION

Figure 1 (top) shows that three of the four precursors (stopping, orienting, and eye contact) occurred on approximately one third of trials in baseline for Adam ($M = 4$ of 12 trials) whereas saying "yes" occurred only once. The second panel shows that his baseline levels of compliance were moderate (Ms = 7 of 12 trials and 5 of 12 trials for initiating tasks and completing instructions, respectively). Similar patterns, but somewhat elevated levels of these same behaviors, were observed with Oscar in baseline. The third panel shows that three of the four precursors (stopping, orienting, and eye contact) occurred on the majority of trials ($M = 8$ of 12 trials) for Oscar, whereas saying "yes" never occurred. The bottom panel shows that Oscar's compliance was also slightly more variable (Ms = 8 of 12 and 5 of 12 trials for initiating tasks and completing instructions, respectively).

Differential reinforcement of precursors resulted in higher and less variable levels of all four precursors for both Adam and Oscar (Ms = 10.6 of 12 trials and 11.6 of 12 trials, respectively). Although there were no changes made to the consequences for compliance or noncompliance, concomitant increases in compliance occurred during treatment as well (Ms

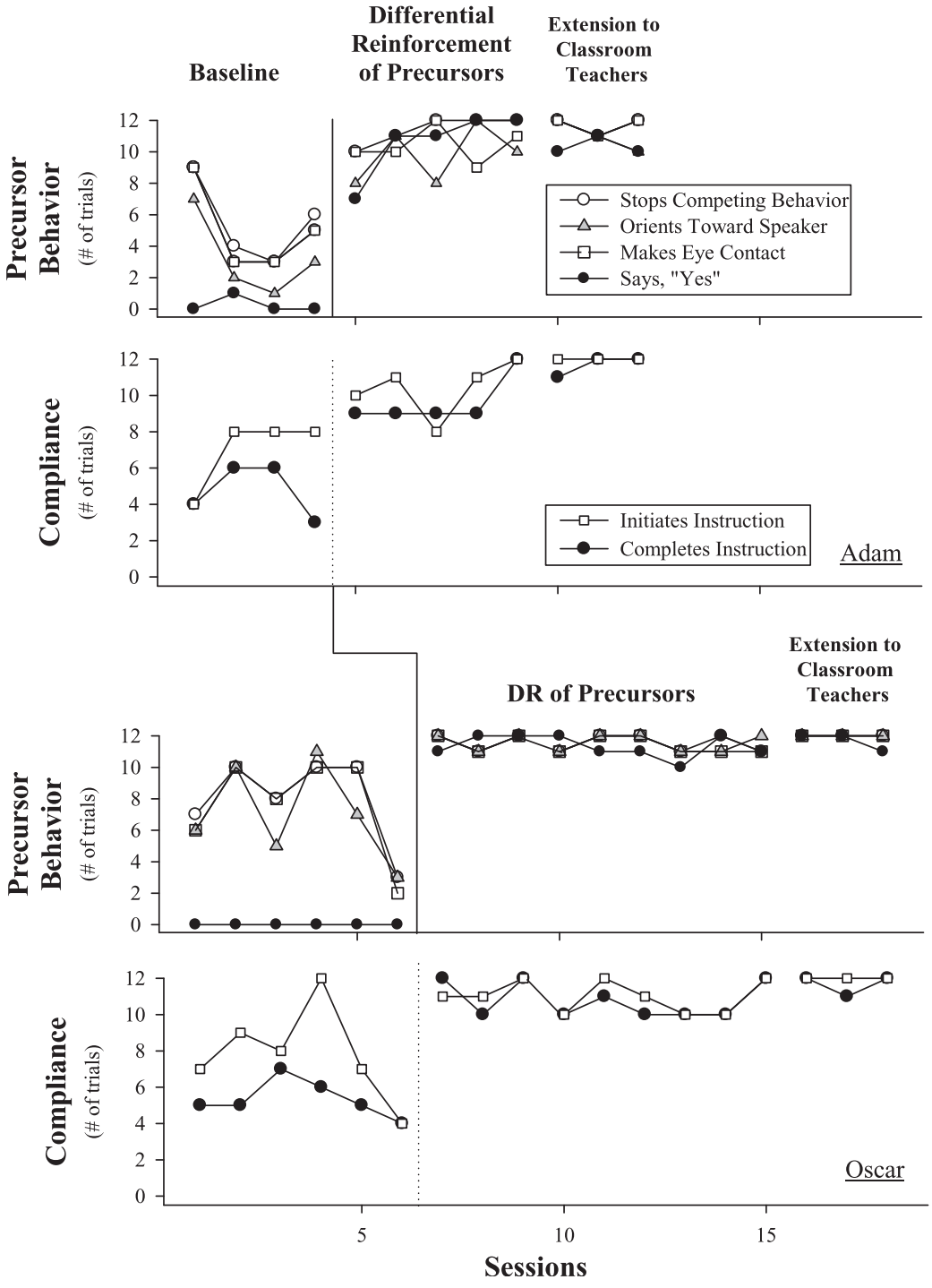

Figure 1. The number of trials with precursors and compliance during the treatment assessments with Adam (top) and Oscar (bottom).

= 10 of 12 trials and 11.2 of 12 trials for Adam and Oscar, respectively). Finally, high levels of precursors and compliance were observed in all sessions conducted by the classroom teachers.

Modeling and differential reinforcement were effective in increasing precursor behaviors. Perhaps more important was that compliance increased and persisted for both children despite no changes to the consequences of compliance or noncompliance. High levels of compliance also were observed when the treatment was implemented by the children's teachers, and compliance occurred at levels higher than those agreed would be an acceptable intervention outcome. These results support the assertion that strengthening stopping, orienting, making eye contact, and saying "yes" following a name call would yield increases in compliance (Hanley et al., 2007). Our results extend those of Hamlet et al. (1984) by showing that higher levels of compliance (90% or better) could be achieved with more generally acceptable methods like modeling and differential reinforcement tactics to strengthen precursors. Our results also add another tactic to the growing technology for improving compliance without explicitly altering the consequences of compliance (see also Iwata, Pace, Kalsher, Cowdery, & Cataldo, 1990; Kodak, Miltenberger, & Romaniuk, 2003).

These data suggest that compliance is not necessarily a discrete response. It may be better to conceptualize compliance as a chain of responses. The tactic of teaching and differentially reinforcing precursors to compliance is probably effective because it strengthens early parts of the chain of behavior that has come to be called compliance (e.g., stopping an existing activity, orienting towards the speaker, initiating and completing the requested action). An important direction for future research would be to compare the relative efficacy of and teacher and student preferences for the more traditional approach of differentially reinforcing compliance (e.g., Piazza et al., 1997; Schutte & Hopkins, 1970) or the procedure of differentially reinforcing precursors to compliance described in the current study.

Two limitations of this empirical analysis are that the long-term and more general effects of increasing compliance via strengthening precursors were not measured, and a tactic for eliminating the token reinforcement program was not demonstrated. It also is not clear whether the contingent delivery of the tokens was essential, because some research has shown that the mere addition of noncontingent reinforcers to instructional contexts may increase compliance (see Ingvarsson, Hanley, & Welter, 2009). Therefore, we believe that it is important for researchers to evaluate the long-term effects of increasing classroom compliance via strengthening precursors, to identify a tactic for eliminating the token reinforcers, and to determine whether the contingency is essential to observed increases in precursors and compliance.

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