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REDUCING STUDENT STEREOTYPY BY IMPROVING TEACHERS' IMPLEMENTATION OF DISCRETE-TRIAL TEACHING

NANCY DIB AND PETER STURMEY

THE GRADUATE CENTER OF THE CITY
UNIVERSITY OF NEW YORK AND QUEENS COLLEGE

Discrete-trial teaching is an instructional method commonly used to teach social and academic skills to children with an autism spectrum disorder. The purpose of the current study was to evaluate the indirect effects of discrete-trial teaching on 3 students' stereotypy. Instructions, feedback, modeling, and rehearsal were used to improve 3 teaching aides' implementation of discrete-trial teaching in a private school for children with autism. Improvements in accurate teaching were accompanied by systematic decreases in students' levels of stereotypy.

DESCRIPTORS: autism, children, discrete-trial teaching, staff training, teacher training, stereotypy

Discrete-trial teaching is an instructional method used to teach social and academic skills to students with an autism spectrum disorder (e.g., Koegel, Russo, & Rincover, 1977). During discrete-trial teaching, the student is presented with a discriminative stimulus (e.g., a red card), is prompted to emit the target response (e.g., instructed "point to red" while his or her hand is physically guided toward the red card), and is presented with a programmed consequence to reinforce the response (e.g., a small edible item). Prompts are then systematically faded until the student independently engages in the target response in the presence of the relevant discriminative stimulus. Not only may this method be effective at increasing desirable student behavior, but it may also concomitantly decrease disruptive or maladaptive student behavior during teaching situations by (a) occasioning and strengthening incompatible behavior or (b) minimizing aversive aspects of teaching situations by arranging a reinforcer-rich environment. Although research has reported several procedures for increasing the fidelity of teachers' implementation of discrete-trial teaching (Koegel et al.; Sarokoff & Sturmey, 2004), none have reported measures of disruptive or maladaptive student behavior. Therefore, the aim of this study was to evaluate changes in students' maladaptive behavior (in the form of stereotypy) as a result of increased accuracy in their teacher's implementation of discrete-trial teaching.

Address correspondence to Nancy E. Dib, 15 S. Hamilton St. Apt. 2D, Poughkeepsie, New York 12601 (e-mail: DibNancy@aol.com).

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METHOD

Participants

Participants were selected from a private school serving children with autism. Dave (12 years old), Mike (12 years old), and Juan (9 years old) were nominated for participation by their teachers. Three teaching assistants were identified via a descriptive assessment who (a) engaged in low levels of accurate discrete-trial teaching and (b) were associated with differentially higher levels of student stereotypy relative to other staff members. Throughout the study, Christie (25 years old) taught Dave, Fran (19 years old) taught Mike, and Irene (20 years old) taught Juan. All staff had been previously trained in behavioral teaching techniques. Sessions were conducted at each student's desk during normal classroom routines. The classroom contained desks, a blackboard, a large table on either side of the room, cabinets, and shelves of materials.

Table 1
Staff Behavior Checklist

Task presentation

1. Remain within 1 m of the student.
2. Say student's name.
3. Initiate eye contact within 3 s. If not obtained within 3 s, put face directly in front of student's and repeat name.
4. Present task with appropriate discriminative stimulus.
5. Prompt student if task is not begun within 3 s of discriminative stimulus (see prompting).

Prompting

For task presentation

1. If task is not started within 3 s of discriminative stimulus, place hand on student's elbow and direct his arm toward the task.
2. If the task is not started within 3-s, place hand on the student's wrist and direct his hand toward the task.

For problem behavior

1. Ignore first instance of problem behavior that is not physically harmful.
2. If problem behavior continues for 5 s, point to the task the student should be working on.
3. If student does not return to task immediately, place a hand on the student's elbow and direct his arm toward the task.
4. If task is not started within 3 s, place a hand on the student's wrist and direct his hand toward the task.
5. Present verbal praise and reinforcement for the student's return to task after 15 s without problem behavior (see reinforcement).

Reinforcement

1. Say a praise statement within 3 s of proper task completion.
2. Place token on student's token board while making praise statement.

Measurement and Interobserver Agreement

Each session was videotaped for later scoring. For each session, data were collected on both staff teaching and student stereotypy. Staff teaching was scored using a staff behavior checklist (see Table 1) that included (a) a list of teaching skills identified by the researchers as integral components of discrete-trial teaching and (b) a list of idiosyncratic skill deficits (identified via a previous descriptive assessment; e.g., initiating eye contact, maintaining 1-m proximity, and timing reinforcer access). During each session, each item on the checklist was scored as either correct, incorrect, or no opportunity. Staff teaching was reported as the percentage of correct opportunities (i.e., the number of correctly completed items divided by the number of opportunities). Student stereotypy, including inappropriate vocalizations (e.g., screaming, talking, singing, or laughing out of context) and repetitive body movements (e.g., arm flapping, finger wiggling, leg lifting, and rocking) was scored using a 10-s momentary time-sampling procedure (i.e., the occurrence or nonoccurrence of stereotypy was scored at the end of each 10-s interval).

Interobserver agreement was measured by having a second observer record staff teaching and student stereotypy during 75% of randomly selected sessions. Observers' scoring records were compared on an item-by-item basis for staff teaching and on an interval-by-interval basis for student stereotypy. Items and intervals were scored in agreement if both observers' scoring records were identical. The total number of agreements was divided by the total number of agreements plus disagreements and multiplied by 100%. Agreement for staff teaching behavior averaged 94%, 100%, and 90% for Christie, Fran, and Irene, respectively. Agreement for student stereotypy averaged 92%, 82%, and 86% for Mike, Dave, and Juan, respectively.

Procedure

All sessions were conducted at the same time each day. For Dave, tasks included writing, math, and building with Legos®. He received verbal and gestural prompts when necessary. For Mike, tasks included reading, matching, and building with Lincoln Logs®. He received verbal and gestural prompts when necessary. For Juan, tasks included matching, imitating

words, and imitating body movements. He received physical prompts when necessary. During baseline, staff members conducted the student's programs as usual. During staff training, a trainer (the school's staff trainer) implemented the researchers' four-step procedure to increase the accuracy of teachers' implementation of discrete-trial teaching. In Step 1, the trainer gave a copy of the staff behavior checklist to the staff member and said, "Please read over the checklist. You will be observed while working with a student in the classroom. There are three components to the checklist upon which you will be scored: task presentation, prompting, and reinforcement and praise." In Step 2, the trainer immediately gave spoken, descriptive feedback including positive comments following appropriate teaching behavior and corrective feedback following inappropriate teaching behavior. For instance, the trainer may have said, "You always prompt correctly" or "You need to work on obtaining eye contact prior to presenting the task." Next, the trainer showed the staff member the data sheet from the previous session and described the teacher's performance. For instance, the trainer may have said, "You were close enough to the student for 90% of intervals, but you prompted correctly during only 30% of intervals." In Step 3, the trainer described the steps of task presentation, prompting, and reinforcement while modeling each relevant target behavior. In Step 4, feedback and modeling were continued until the checklist was completed without errors two consecutive times. During posttraining, staff members did not receive any further training. They were instructed to conduct the student's usual programs. The effects of training on staff teaching and child stereotypy were evaluated in a multiple baseline design across teacher–student dyads.

RESULTS AND DISCUSSION

Figure 1 shows the percentage of opportunities in which teachers engaged in accurate discrete-trial teaching and the percentage of intervals with student stereotypy during baseline and posttraining conditions. Christie's teaching accuracy averaged 1% during baseline and increased to 100% posttraining. During the same baseline period, Mike engaged in stereotypy during an average of 55% of intervals, which decreased to 7% posttraining. Fran's teaching accuracy averaged 0% during baseline and improved to 100% posttraining. During the same baseline period, Dave engaged in stereotypy during 20% of intervals, which decreased to 5% posttraining. Irene's teaching accuracy averaged 4% during baseline and increased to 100% posttraining. During the same baseline period, Juan engaged in stereotypy during an average of 65% of intervals, which decreased to 10% posttraining.

These data show that increasing the accuracy of implementation of discrete-trial teaching resulted in systematic decreases in student stereotypy across three teacher–student dyads. These findings are consistent with previous studies using similar techniques to increase the accuracy of teachers' implementation of discrete-trial teaching (e.g., Koegel et al., 1977; Sarokoff & Sturmey, 2004) and extends this literature by demonstrating that improved teaching may minimize students' disruptive or maladaptive behavior during these teaching situations.

There were several limitations of the current study that may be addressed in future research. First, we did not conduct a functional analysis to identify the function of stereotypy, and thus the behavioral mechanisms by which improved discrete-trial teaching reduced stereotypy were unclear. Stereotypy may have been reduced by the closer proximity of the teacher, the more dense delivery of attention during teaching sessions, the sequential implementation of prompts during teaching, the implementation of response blocking, or the strengthening of incompatible academic behavior. Identifying the functional reinforcers for stereotypy would

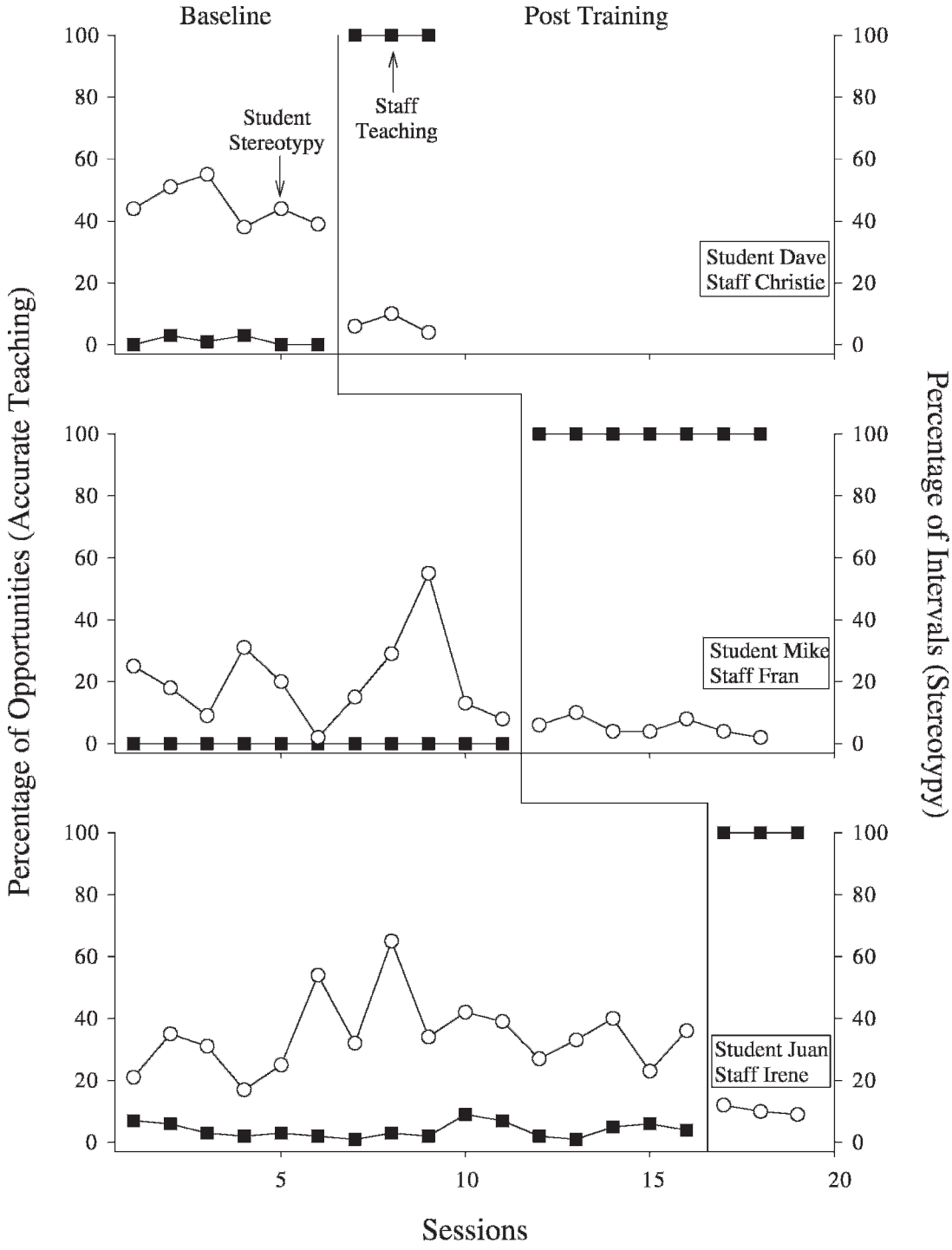

Figure 1. A multiple baseline across teacher–student dyads showing the percentage of opportunities in which the teacher's implementation of discrete-trial teaching was accurate (filled squares, left *y* axis) and the percentage of intervals in which students engaged in stereotypy (open circles, right *y* axis) across baseline and posttraining phases.

permit more accurate isolation of the components of discrete-trial teaching necessary to achieve these reductions. Second, this study measured stereotypy only during instructional situations. More comprehensive interventions would likely be needed to reduce stereotypy throughout the day. Finally, improvements in teaching behavior were observed only in the presence of a single child. Future research should assess the extent to which improvements in teaching behavior generalize across students.

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