

Improving Discrete Trial Instruction by Paraprofessional Staff Through an Abbreviated Performance Feedback Intervention

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Abstract

We evaluated an abbreviated performance feedback intervention as a training strategy to improve discrete trial instruction of children with autism by three paraprofessional staff (assistant teachers) at a specialized day school. Feedback focused on 10 discrete trial instructional skills demonstrated by the staff during teaching sessions. Following sessions, staff received verbal praise from a trainer for skills displayed correctly, and clarification/redirection was given contingent on incorrect performance. As demonstrated in a multiple baseline design, staff rapidly acquired the discrete trial instructional skills with intervention. Improved instruction was maintained up to 11 weeks post-training, and procedures were judged highly acceptable by staff. The benefits of performance feedback, and issues related to staff training, are discussed. **KEYWORDS:** *performance feedback, staff training, discrete trial instruction, autism.*



Discrete trial instruction (DTI) is an effective teaching methodology for children who have autism (Lovaas, 1987; New York State Department of Health, 1999). DTI is based on principles of applied behavior analysis (ABA), emphasizing systematic presentation of learning opportunities, prompting accurate responding, delivering positive reinforcement, and correcting response errors. With DTI, learning objectives are defined in behavior-

Authors' Note: This study was based on a thesis submitted by the first author in partial fulfillment of the Masters in Applied Behavior Analysis at Northeastern University, Boston, MA. The authors thank Tania Trembl, Jennifer Gower, and Jennifer Fitzgibbons for their assistance, and the participating assistant teachers and students at The May Center for Early Childhood Education, Arlington, MA. Requests for reprints should be sent to James K. Luiselli, The May Institute, 1 Commerce Way, Norwood, MA 02062 (Email address: jluiselli@mayinstitute.org).

specific terminology, acquisition criteria are established, and progress is measured through continuous data collection. Many educational settings for children with autism incorporate DTI as an integral component of service delivery (Green, Brennan, & Finn, 2002; Maurice, Green, & Foxx, 2001).

Paraprofessional staff members frequently teach children who have autism and accordingly, must be trained to deliver instruction properly. Many staff training protocols have been researched, and although different strategies are possible, several key elements are noteworthy (Ducharme & Feldman, 1992; Ivancic, Reid, Iwata, Faw, & Page, 1981; Parsons & Reid, 1995; Shore, Iwata, Vollmer, Lerman, & Zarcone, 1995). First, training should be practical and time efficient for both trainers and trainees. Training programs that are complex, labor intensive, or require inordinate oversight are unlikely to be embraced by most human service agencies. Second, the training they receive should be judged favorably by staff. Like other behavioral interventions, acceptability by practitioners is a critical determinant of social validity (Kennedy, 2002). Finally, competencies acquired during training should not deteriorate but instead, be maintained long-term. For most educational settings serving children with autism, easily implemented staff training, which produces lasting effects and has good social validity, would be valued by administrators, practitioners, and learners alike.

The study described in this report evaluated a training program to improve DTI by paraprofessional staff at a school for children with developmental disabilities. In a recent study, Lavie and Sturmey (2002) trained assistant teachers to perform paired-stimulus preference assessments using verbal review, videotaped demonstration, and performance feedback. Similarly, Moore et al (2002) used performance feedback, which was combined with written scripts, verbal review, rehearsal, and modeling, in training teachers to conduct functional analyses. Each study documented rapid acquisition of target skills but neither reported maintenance outcomes. Further, although the multicomponent training programs designed by Lavie & Sturmey (2002) and Moore et al (2002) may be required to achieve optimal results, it would be advantageous to identify an approach that is less rigorous but equally effective. In the present study, we selected abbreviated performance feedback as a singular training method, measured outcome several months post-training, and assessed staff acceptability of the training program.

Method

Participants and Setting

The study was conducted at a private school for children with developmental disabilities. The participants were 3 female assistant teachers and 3 male students (ages 5-9) diagnosed with autistic disorder. At the time of the study, the assistant teachers had been employed at the school for less

than 6 months. They were familiar with the students, but had not conducted discrete trial instruction with them. The students had been taught previously by other staff members using discrete trial methodology. Each assistant teacher was assigned a specific student for the duration of the study.

Measurement

The students received instruction on learning programs that were specified in their individualized educational plans (e.g., identifying letters, labeling objects, answering questions). The assistant teachers implemented 10 trials of 3 programs (total = 30 trials) in a single session lasting 10-15 minutes. Sessions were conducted in a therapy room that contained two chairs, a small table, and materials used during instruction. Only the student, assistant teacher, and an observer were present during sessions that were scheduled 1-2 times each week.

Measurement was performed with a checklist that included 10 discrete trial instructional skills. During all sessions within baseline, intervention, and follow-up phases, an observer recorded whether the assistant teacher did or did not display the skills as defined on the checklist for each of the 30 trials presented to the student. The 10 discrete trial instructional skills were: (1) arrange environment, (2) direct student to session, (3) orient student, (4) secure student's attention, (5) present discriminative stimulus, (6) deliver level of prompting designated in learning program, (7) reinforce student's accurate response, (8) correct student's inaccurate response (as warranted), (9) pause 3-5 seconds between trial presentations, and (10) record data following each completed trial (a copy of the discrete trial instructional skills checklist is available on request from the third author). The observer sat approximately 8ft from the student assistant teacher pair and recorded data as the session progressed.

Interobserver Agreement

A second individual independently recorded data with the primary observer during 27% of sessions distributed across baseline, intervention, and follow-up phases. Based on a trial by trial comparison of the 30 trials per session, an agreement was scored if both observers recorded the assistant teacher's correct performance of the discrete trial instructional skill. A disagreement was documented if there was a discrepancy between observers. Interobserver agreement (IOA) was calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. Average IOA for the 3 assistant teacher/student pairs was 97% (range 90-100%).

Social Validity Assessment

After the final follow-up session, the assistant teachers anonymously completed the Acceptability Rating Scale (Davis, Ramana, & Capponi, 1989). The scale is a 26-item Likert-type instrument, with an item score of 6 indicating "high acceptability."

Experimental Design and Procedures

Baseline and intervention phases were evaluated in a multiple baseline design across assistant teachers. Introduction of intervention with assistant teacher 1 and assistant teacher 2 was determined randomly, and began with assistant teacher 3 when she was added subsequently to the study.

Baseline. The participants did not receive training in how to conduct discrete trial instruction. As a feature of their preservice training at the day school, they had been taught basic principles of applied behavior analysis. Also, each assistant teacher implemented teaching sessions with her assigned student, but were not shown the discrete trial instructional skills checklist or given similar information. Preceding baseline sessions, they were requested simply to instruct students according to the designated learning programs. When each session concluded, the assistant teachers were acknowledged, but performance feedback was not provided.

Abbreviated Performance Feedback. Before the first intervention session with each participant, a trainer (first author) reviewed the discrete trial instructional skills checklist. Immediately following sessions, the trainer gave performance feedback for each of the 10 discrete trial instructional skills. The feedback for skills demonstrated correctly 100% of the time consisted of praise and approval (e.g., "Very good, you made sure the student was looking at you every time before starting a trial."). When a skill was not exhibited correctly 100% of the time, the feedback entailed clarification and verbal direction (e.g., "Remember, you should wait 3-5 seconds between trials."). During feedback interactions, the trainer answered any questions posed by an assistant teacher. However, the trainer did not model, role play, or practice correct performance of skills. It required approximately 8-10 minutes for the trainer to implement the performance feedback intervention. Training with the assistant teachers terminated when each demonstrated the discrete trial instructional skills correctly 90% of the time or greater during two consecutive sessions.

Follow-up. The assistant teachers were observed during a discrete trial instructional session with their assigned student 2, 4, 7, and 11 weeks following termination of the performance feedback intervention. Baseline (no feedback) conditions were in effect at follow-up.

Results

Figure 1 presents the percentage of discrete trial instructional skills implemented correctly by the 3 assistant teachers during baseline, performance feedback, and followup phases. At baseline, the assistant teachers displayed skills less than 50% of the time (assistant teacher 1 $M = 43\%$, assistant teacher 2 $M = 32\%$, assistant teacher 3 $M = 40\%$). With training provided through performance feedback, each assistant teacher rapidly acquired instructional skills, achieving the terminal criterion in 4 sessions (assistant teacher 1), 5 sessions (assistant teacher 2), and 4 sessions (assistant teacher 3). At followup, the performance of the 3 assistant teachers was maintained at 90- 100%.

The assistant teacher responses on the Acceptability Rating Scale indicated that the performance feedback intervention had high acceptability. The average scores (+/standard deviation) per item were 5.8 (+/- 0.5) for assistant teacher 1, 4.6 (+/- 0.6) for assistant teacher 2, and 5.2 (+ 0.8) for assistant teacher 3.

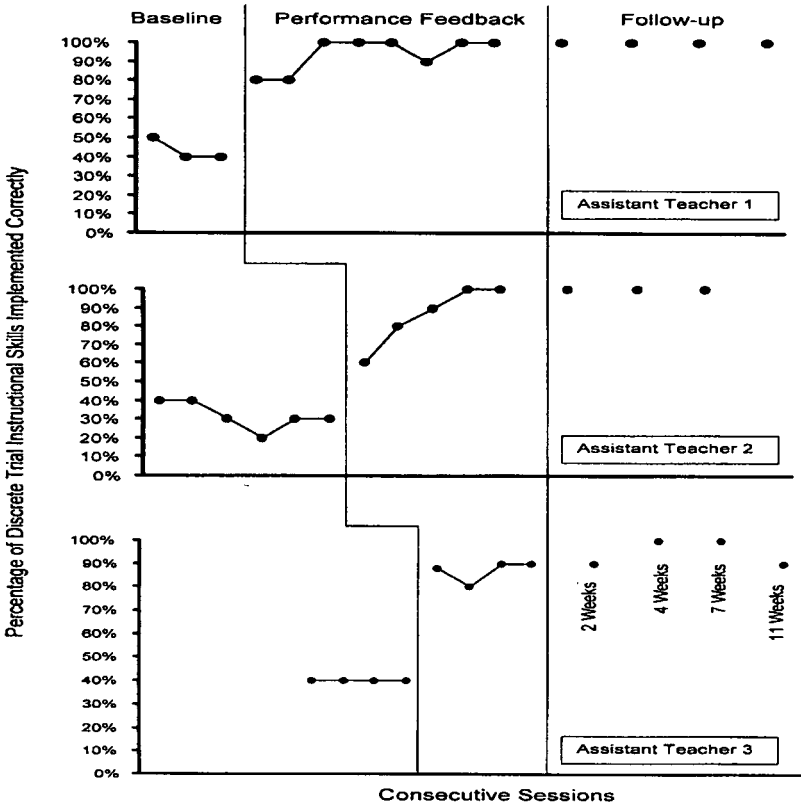


Figure 1. Percentage of discrete trial instructional skills implemented correctly during baseline, performance feedback, and follow-up phases.

Discussion

Abbreviated performance feedback was effective in improving the discrete trial instructional skills of paraprofessional staff. As noted previously, DTI is an effective, evidence based educational methodology for children who have autism. Our concerns in this study were to evaluate a practical and efficient training strategy specific to DTI, measure acceptability by staff, and document long-term outcome. In summary, the 3 assistant teachers showed rapid improvement, they judged training as highly acceptable, and their instructional skills were maintained without additional performance feedback.

Our findings extend the research of Lavie and Sturme (2002) and Moore et al (2002) who demonstrated that behavior analytic skills can be learned quickly by nonspecialist staff. We selected performance feedback as the primary training procedure because it has been shown to be a successful approach toward personnel management that can be adapted to a variety of applied settings (Alavosius & Sulzer-Azaroff, 1986; Alvero, Bucklin, & Austin, 2001; Page, Iwata, & Reid, 1982; Parsons & Reid, 1995; Richman, Riordan, Reiss, Pyles, & Bailey, 1988). Significantly, the brief duration feedback was implemented without other procedures, and integrated easily into the school setting using already existing resources.

We note that the 3 assistant teachers performed some of the discrete trial instructional skills correctly before training was introduced. It is unclear whether the performance feedback intervention would have the same effect with trainees who were less competent at baseline. We speculate that the assistant teachers likely learned some of the discrete trial instructional skills before training by observing similar teacher-student interactions in the classroom. Another consideration is that although intervention clearly produced positive behavior change among the assistant teachers, corresponding data were not collected on *student* performance. That is, it would have been informative to validate student gains that were associated with enhanced instruction. Finally, each assistant teacher taught the same student and focused on a limited number of learning objectives. Future research on this topic should assess whether training generalizes to other students receiving discrete trial instruction or to novel and more varied learning programs.

Other aspects of DTI should be discussed. Similar to documentation of student performance, measuring the effectiveness of staff training also should consider possible challenging behaviors occasioned during instruction. The students in the present study did not demonstrate in-session problems such as disruption or noncompliance, but potentially such behavior could be a concern and merits objective evaluation. Relative to how paraprofessional staff members perform DTI past their initial training, we found good maintenance, but did not explore formally factors responsible for this outcome. For example, it could be informative to have staff report what elements of students' learning ("direct-acting" contingencies) and instruc-

tors' thinking ("rule governed" contingencies) guide decision making during sessions. A final comment is that the pacing of trial presentations within DTI and the number of sessions scheduled each week may vary from one educational setting to another. Such variability likely could affect rate of learning by students and staff members.

The contribution of DTI to the education of children with autism is dependent, in part, on the teaching skills of practitioners. As revealed in this study, abbreviated performance feedback can be employed efficaciously to train paraprofessional staff in the skills comprising DTI. It is a practical procedure that could be used to train educators new to this method of instruction, or to improve the proficiency of individuals who have acquired some, but not all, requisite skills.

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