

*DIFFERENTIAL REINFORCEMENT WITH AND  
WITHOUT INSTRUCTIONAL FADING*

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We evaluated a differential-reinforcement-based treatment package for the reduction of problem behavior during instructional situations. Differential reinforcement of alternative behavior (DRA; compliance) was implemented across two conditions. During one condition, instructions were presented approximately once every other minute. This condition was considered the terminal goal for treatment. During the second condition, the rate of instructions was gradually increased (beginning at zero and ending when instruction rate was similar to the first condition). Results indicated that DRA with instructional fading resulted in less problem behavior than DRA without instructional fading. These results are similar to previous studies regarding the utility of instructional fading.

DESCRIPTORS: instructional fading, negative reinforcement, developmental disabilities

The treatment of problem behavior maintained by negative reinforcement remains an important topic for behavioral research (DeLeon, Neidert, Anders, & Rogdriguez-Catter, 2001; Hagopian, Wilson, & Wilder, 2001). The use of instructional (demand) fading has been demonstrated to be effective as a single component of treatment (Pace, Ivancic, & Jefferson, 1994). When used in conjunction with escape extinction, Zarcone et al. (1993) demonstrated that instructional fading plus escape extinction resulted in less problem behavior than escape extinction without instructional fading. Piazza, Moes, and Fisher (1996) demonstrated a reduction in destructive behavior exhibited by 1 participant using a differential-reinforcement-of-alternative-behavior (DRA) procedure that included escape extinction (without physical guidance) and instructional fading.

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However, it is unclear whether including an instructional fading component in a DRA-based treatment package would have any benefit beyond using DRA only (i.e., DRA without instructional fading). The purpose of the current evaluation was to compare the use of a DRA package with and without instructional fading in the treatment of a young girl's task-related problem behavior.

## METHOD

### *Participant and Setting*

One individual (Kristina) participated in this study. A previous functional analysis had demonstrated that Kristina's problem behavior was maintained by escape from instructions. Kristina had been admitted to a hospital day treatment program for implementation of suggested treatment procedures. Kristina was 8 years old, had been diagnosed with autism, and functioned in the moderate range of mental retardation.

All sessions were observed via video monitoring, with sessions conducted in either a therapy room or a classroom located at the

hospital. Location of sessions varied with condition (see below).

#### *Recording and Interobserver Agreement*

Data were collected on laptop computers using the "Observe" program. This program allows real-time data collection. The program also provides a summary of data (responses per minute or percentage of session time) at the end of the designated observation period. Observers trained in the use of this program collected all data. Observers recorded destruction (throwing work or leisure items, tearing or breaking work materials), aggression (hitting, kicking, grabbing, or biting the therapist), and self-injurious behavior (SIB; biting herself). Destruction, aggression, and SIB were collapsed into one measure reported as number of responses per minute. Observers also recorded each academic instruction that was delivered. Instruction was reported as responses per minute. On 22.6% of all sessions, independent observers collected data via videotapes of the sessions. Agreement percentages were calculated based on 10-s interval-by-interval comparisons of the observers' records. The smaller number of responses in each interval was divided by the larger number of responses. These fractions were then summed across all intervals, divided by the total number of intervals, and multiplied by 100%. Agreement averaged 98.8% (range, 97.5% to 100%) for problem behavior and 91.4% (range, 78% to 95.8%) for instruction delivery.

#### *Experimental Design and Procedure*

A multielement design was used to assess the effects of DRA with and without instructional fading. All sessions of DRA without instructional fading were conducted in the classroom. These sessions lasted 30 to 60 min, depending on the day's schedule. All sessions of DRA with instructional fading were conducted in a separate therapy room. These sessions lasted 45 min. In the class-

room (DRA without fading), sessions were conducted by Kristina's teacher with assistance from a behavior therapist. In the therapy room (DRA with fading), sessions were conducted by the behavior therapist. The same instructional material (e.g., spelling cards, shape- and color-matching cards, and counting materials) and leisure materials (e.g., beads; available during break times) were included across conditions.

*DRA without instructional fading.* During this condition, Kristina was provided with instructions approximately once every other minute. Compliance (defined as independent completion of the instruction in the absence of problem behavior) resulted in a 1-min break. Access to leisure materials was allowed during the break. Problem behavior during instruction resulted in presentation of another instruction and restoration of the environment if destruction had occurred. If problem behavior occurred during the break, the break was terminated, Kristina was prompted to restore the environment (in the event of destruction), and a new academic instruction was delivered. Because of this treatment component (i.e., contingent presentation of instruction following problem behavior), the overall instruction rate could vary.

*DRA with instructional fading.* The contingencies during this condition were identical to DRA without instructional fading. At the outset of this condition, no instructions were delivered for three consecutive sessions. Following those sessions, instruction rate was gradually increased. Initially, only one instruction was programmed for delivery every 15 min. One instruction every 15 min was added following each 45-min session with no problem behavior. Again, due to the structure of the package, the instruction rate could vary from what was programmed. The evaluation ended when instruction rates for each condition were equivalent.

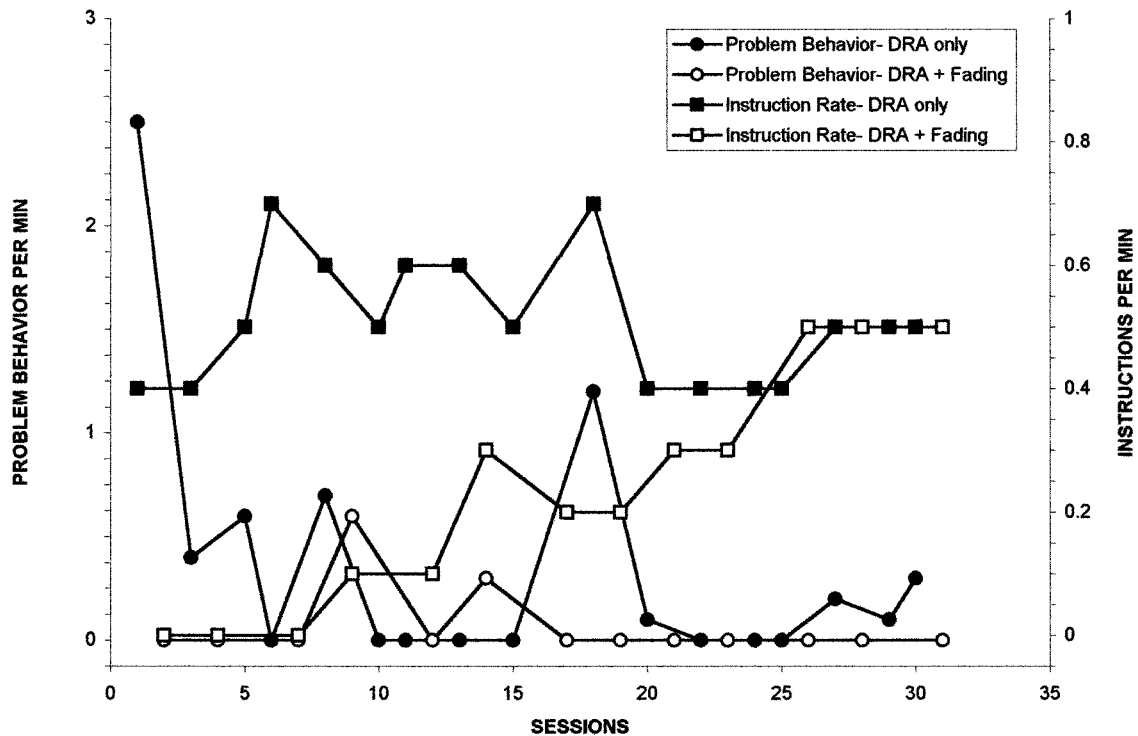


Figure 1. Problem behavior and instructions per minute across the experimental conditions.

## RESULTS AND DISCUSSION

Figure 1 displays the results of the treatment evaluation. During DRA without instructional fading, problem behavior was initially high. However, problem behavior decreased across sessions. For the final three sessions (when instruction rates were equal across conditions) of DRA without instructional fading, problem behavior averaged 0.2 responses per minute. Instruction rate during DRA without instructional fading varied between 0.4 and 0.7 instructions per minute and averaged 0.5 instructions per minute during the final three sessions. During DRA with instructional fading, problem behavior was low from the outset. In fact, problem behavior was observed during only two of the sessions (Sessions 9 and 14). For the final three sessions of this condition, problem behavior averaged 0 and instruction rate was equal to DRA without instructional fading (0.5 instructions per minute).

These results replicate previous research on instructional fading (Pace et al., 1994; Piazza et al., 1996; Zarcone et al., 1993). The use of instructional fading typically results in very low levels of problem behavior that are sustained as the instruction rate increases. Therefore, instructional fading can be successfully incorporated as a component of a DRA-based treatment package. One reason instructional fading results in rapid reduction might be that the schedule of instruction alters the value of escape as a reinforcer (i.e., serves as an establishing operation). When treatment is introduced, breaks might be less valued as a reinforcer because, in essence, much of the session is a break. Presenting the instructions on a limited basis also allows a history of reinforcement for compliance to be established. As the schedule is gradually increased, the history of reinforcement for compliance might then help to maintain

appropriate responding. These results also extend the previous literature on the effects of instructional fading. Only one previous study (Zarcone *et al.*, 1993) directly compared similar treatments with and without instructional fading. The current study provides another example of such a direct comparison.

There are at least two limitations to the current study. One limitation is that the effect was demonstrated for only a single participant. Thus, the results should be interpreted with caution regarding their generality. Second, because each condition was confined to a unique setting, it is possible that the results obtained are a function of the setting. Future research could evaluate the various conditions in the same setting using different discriminative stimuli to determine if the effects are due to schedule of instruction or setting.

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