

*A COMPARISON OF VARIOUS FORMS OF REINFORCEMENT  
WITH AND WITHOUT EXTINCTION AS TREATMENT FOR  
ESCAPE-MAINTAINED PROBLEM BEHAVIOR*

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The present investigation compared the effects of reinforcing compliance with either positive or negative reinforcement for a participant who displayed escape-maintained problem behavior. The results indicated that positive reinforcement in the form of a highly preferred edible or leisure item produced higher levels of compliance and lower levels of problem behavior when compared to negative reinforcement in the form of escape from demands. In addition, an extinction procedure was unnecessary to achieve high levels of compliance.

*Key words:* escape-maintained extinction, functional analysis, negative reinforcement, positive reinforcement, problem behavior

Positive reinforcement without extinction can be an effective treatment for problem behavior maintained by negative reinforcement or by a combination of positive and negative reinforcement (DeLeon, Neidert, Anders, & Rodriguez-Catter, 2001; Kodak, Lerman, Volkert, & Trosclair, 2007; Lalli et al., 1999; Piazza et al., 1997). Previous research has evaluated choice of positive or negative reinforcement with children with escape-maintained behavior (Gardner, Wacker, & Boelter, 2009). DeLeon et al. found that a child who engaged in escape-maintained problem behavior chose a food item over a break when work requirements were low (e.g., fixed-ratio 1), but chose a break when work requirements increased. Similarly, Kodak et al. evaluated choice between concurrently available forms of positive and negative reinforcement under increasing schedule requirements with individuals who engaged in problem behavior maintained by escape from demands. Results indicated that participants selected high-preference food items over breaks (even when the breaks contained access to high-preference toys).

Other studies have examined the necessary and sufficient treatment components for reduc-

ing escape-maintained problem behavior and increasing compliance with demands when extinction was not included as a component of treatment. Piazza et al. (1997) showed that destructive behavior maintained by positive and negative reinforcement was reduced for two of three participants when compliance produced access to tangible items, despite continued negative reinforcement for problem behavior. Lalli et al. (1999) extended this line of research by examining the effects of positive and negative reinforcement with and without extinction on the escape-maintained problem behavior of five participants. Results showed high levels of compliance and reductions in problem behaviors for all participants when compliance produced positive reinforcement (i.e., an edible item) rather than escape from demands. However, the authors did not evaluate whether alternative forms of positive reinforcement (e.g., social praise, leisure items) would have produced similar results. The current study replicated and extended Lalli et al. by comparing the effects of positive and negative reinforcement with and without extinction on levels of compliance and problem behavior with an individual who engaged in escape-maintained problem behavior. Specifically, the current study evaluated whether providing other forms of positive reinforcement (e.g., low-preference

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edible items and high-preference leisure items) contingent on compliance would result in reductions in problem behavior and increases in compliance similar to levels observed by Lalli et al.

## METHOD

### *Participant and Setting*

A 19-year-old man with profound mental retardation and a history of destructive behavior participated in the investigation. He was capable of following two-step instructions and communicated through gestures and limited vocalizations. He required supervision and direct assistance with self-care activities. All sessions were conducted in a therapy room or a changing room that included a sink for self-care activities (e.g., hand washing).

### *Response Definitions and Data Collection*

*Destructive behavior* included aggression (slapping, pushing, hitting, or head butting) and disruption (throwing or destroying items). *Compliance* was defined as completing the demand within 5 s of a verbal prompt. Data were collected on destructive behavior and compliance using a 10-s partial-interval recording procedure during 5-min sessions. Interobserver agreement was scored using interval-by-interval comparisons, calculated by dividing the number of intervals the observers agreed that any behavior (regardless of the amount) occurred by the total number of intervals, and converting that ratio into a percentage. Mean interobserver agreement, obtained during 30% of conditions, was 92% (range, 80% to 100%).

### *Functional Analysis*

The functional analysis consisted of procedures similar to those described by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994). During the attention condition, leisure items were available, and the therapist diverted her attention except to provide reprimands contingent on problem behavior. The tangible condition involved the provision of the tangible

item for 2 min prior to the session, removal of the item at the beginning of the session, and 30-s access following each occurrence of destructive behavior. The demand condition consisted of a least-to-most prompting hierarchy (verbal, model, and physical assistance) delivered every 30 s, descriptive praise for compliance, and a 30-s break for destructive behavior. The demand condition incorporated self-care tasks (e.g., putting on or removing jacket or shoes, washing hands, wiping face). During the toy play condition, preferred items were available, attention was provided on a 30-s schedule, and there were no programmed consequences for destructive behavior.

### *Preference Assessment*

A paired-choice stimulus preference assessment was conducted for (a) food and (b) leisure items prior to treatment sessions (Fisher et al., 1992). High-preference items were those selected on at least 80% of all trials, and all other items were considered to be low preference. High-preference edible items included cookies and soda, and low-preference items were crackers, chips, dry cereal, pretzels, applesauce, and peanuts. High-preference leisure items included stickers and 30 s of music.

*Experimental design.* A series of reversals was used to evaluate the effects of treatment on compliance and destructive behavior.

*Baseline.* The baseline condition was identical to the demand condition of the functional analysis and included the same type of demands.

*High-preference edible item for compliance plus escape for destructive behavior (Sr+HPE/Sr-).* Prior to the delivery of an instruction, the therapist described the contingency for compliance (e.g., "When you —, then you get —") while presenting the item. The therapist randomly delivered the high-preference edible items when the participant completed the task following the verbal prompt. Instructions continued while the participant consumed the reinforcer. Following an occurrence of destructive behavior, the participant received a 30-s break.

*Escape for compliance or destructive behavior (Sr-/Sr-)*. The therapist described the contingencies to the participant prior to the session. Both compliance with a verbal demand and destructive behavior resulted in a 30-s break.

*High-preference leisure item for compliance plus escape for destructive behavior (Sr+HPL/Sr-)*. This condition was the same as Sr+HPE/Sr- except that the therapist delivered a high-preference leisure item following compliance. The therapist arbitrarily alternated between turning on a radio and placing a sticker on a notebook. Some instances of overlapping reinforcement occurred when the therapist placed a sticker on the notebook while the radio was playing or vice versa.

*Low-preference edible item for compliance plus escape for destructive behavior (Sr+LPE/Sr-)*. This condition was the same as Sr+HPE/Sr- except that the therapist provided a low-preference edible item following compliance.

RESULTS AND DISCUSSION

The results of the functional analysis showed that destructive behavior was maintained by escape from self-care demands (Figure 1, top). During the initial treatment analysis (Figure 1, middle), presentation of a high-preference edible item contingent on compliance increased compliance and reduced destructive behavior even though destructive behavior produced a 30-s break from the task. Throughout the negative reinforcement for compliance and destructive behavior phase of the initial treatment analysis, the provision of a 30-s break from the tasks for both compliance and destructive behavior produced levels of responding similar to those observed during baseline.

During the follow-up treatment analysis (Figure 1, bottom), presentation of a high-preference item contingent on compliance increased compliance and reduced destructive behavior even though destructive behavior produced a 30-s break from the task, as occurred in the initial treatment analysis. In

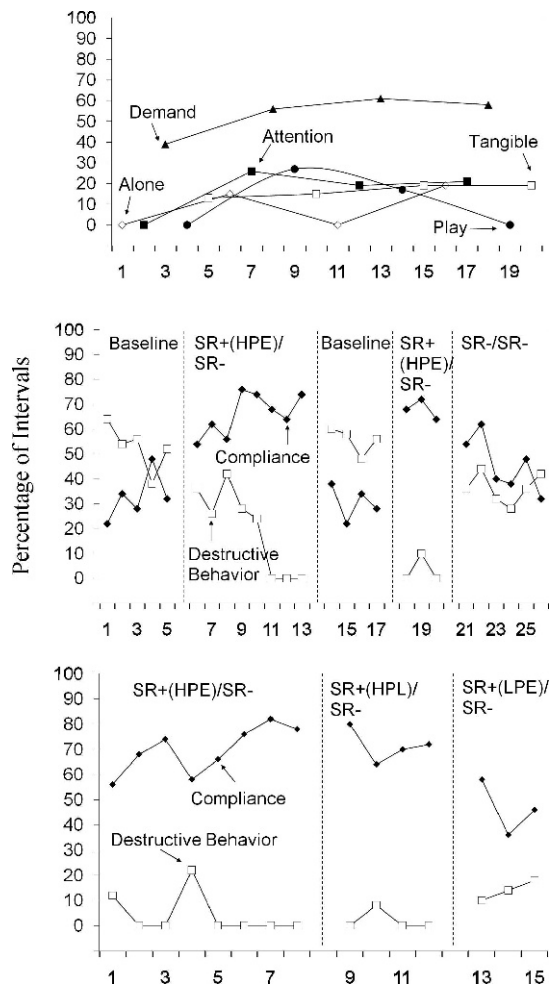


Figure 1. Results of the functional analysis, the initial treatment analysis, and the follow-up treatment analysis are shown in the top, middle, and bottom panels, respectively. Sr+HPE/Sr- = high-preference edible for compliance plus escape for destructive behavior; Sr-/Sr- = escape for compliance or destructive behavior; Sr+HPL/Sr- = high-preference leisure item for compliance plus escape for destructive behavior; Sr+LPE/Sr- = low-preference edible item for compliance plus escape for destructive behavior.

addition, presentation of a high-preference leisure item maintained high levels of compliance and low levels of destructive behavior in the second phase. However, delivery of a low-preference edible item contingent on compliance in the third phase resulted in a decrease in compliance and an increase in destructive

behavior. Despite these findings, the results of the follow-up treatment analysis should be interpreted cautiously and regarded as preliminary because the effects of the high-preference leisure item and the low-preference edible items were not replicated.

The results of this study are consistent with those of Lalli et al. (1999), further demonstrating the effectiveness of a treatment that provides high-preference items contingent on compliance in the absence of extinction. Escape extinction may be especially difficult to implement with individuals who display severe forms of aggression. Thus, treatments that do not require escape extinction should continue to be evaluated. Results also extended the findings of Lalli et al. by maintaining low levels of problem behavior and higher levels of compliance when high-preference leisure items were provided contingent on compliance. This is potentially important because dietary restrictions may require the need to identify reinforcers other than food items that may effectively compete with the reinforcement produced by problem behavior.

One limitation of this study was the possibility of order effects among the treatment conditions. In the initial treatment analysis, the final phase in which negative reinforcement of compliance was evaluated followed a phase in which positive reinforcement was delivered contingent on compliance. Thus, it is possible that discontinuation of positive reinforcement lessened the potential effectiveness of negative reinforcement of compliance. Conversely, in the follow-up treatment analysis, the introduction of the high-preference leisure item in the second phase followed a phase in which compliance was high and destructive behavior was low (due to the high-preference edible item). Thus, it is not clear whether the high-preference leisure

item would have produced comparable reductions in destructive behavior and increases in compliance if it were introduced immediately after baseline. Future research should attempt to replicate the results of the current study with additional participants and with a more rigorous experimental design.

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