

*FUNCTIONAL ANALYSIS AND TREATMENT OF  
DESTRUCTIVE BEHAVIOR MAINTAINED BY  
TERMINATION OF “DON’T” (AND  
SYMMETRICAL “DO”) REQUESTS*

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We used descriptive assessment information to generate hypotheses regarding the function of destructive behavior for 2 individuals who displayed near-zero rates of problem behavior during an experimental functional analysis using methods similar to Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994). The descriptive data suggested that destructive behavior occurred primarily when caregivers issued requests to the participants that interfered with ongoing high-probability (and presumably highly preferred) behaviors (i.e., a “don’t” or a symmetrical “do” request). Subsequent experimental analyses showed that destructive behavior was maintained by contingent termination of “don’t” and symmetrical “do” requests but not by termination of topographically similar “do” requests. These results suggested that destructive behavior may have been maintained by positive reinforcement (i.e., termination of the “don’t” request allowed the individual to return to a highly preferred activity). Finally, a treatment (functional communication training plus extinction) developed on the basis of these analyses reduced destructive behavior to near-zero levels.

DESCRIPTORS: aggression, descriptive assessment, “do” and “don’t” requests, functional analysis, property destruction, response–response relations, stereotypy

The functional analysis method developed by Iwata and colleagues (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994; Iwata et al., 1994) has greatly improved our ability to study and treat aberrant behavior displayed by individuals with developmental disabilities. This method was originally designed to test three operant hypotheses (Carr, 1977) regarding the function of self-injurious behavior (SIB): that SIB was maintained by (a) positive reinforcement in the form of contingent attention, (b) negative reinforcement in the form of escape from nonpreferred tasks, or (c) the sensory stim-

ulation automatically produced by SIB (i.e., a form of automatic reinforcement). Since the publication of Iwata et al.’s seminal paper, functional analysis methods have been extended across a variety of different responses, populations, and settings (e.g., Chapman, Fisher, Piazza, & Kurtz, 1993; Cooper et al., 1992; Durand & Carr, 1987; Northup et al., 1995).

There are two primary features of the Iwata et al. (1982/1994) functional analysis method that, in combination, distinguish it from most other functional assessment strategies: (a) the inclusion of specific establishing operations (Michael, 1993) designed to evoke problem behavior belonging to a particular operant class (e.g., deprivation of attention in the attention condition, nonpreferred tasks in the demand condition), and (b) direct manipulation of the contingencies hypothesized to maintain the target response

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(e.g., delivery of contingent attention in the attention condition, escape from nonpreferred tasks in the demand condition). In studies that have employed this basic approach across a large number of participants, specific behavioral functions were identified in most cases (Derby *et al.*, 1992; Iwata *et al.*, 1994; Vollmer, Marcus, Ringdahl, & Roane, 1995). However, in a small but significant number of cases, the results were inconclusive.

One pattern of responding observed with inconclusive functional analyses is that response rates are relatively high and stable across all of the functional analysis conditions (including the alone condition). It has been suggested that this pattern often occurs when the response is maintained by automatic reinforcement in the form of sensory stimulation or attenuation (e.g., Hagopian *et al.*, 1997; Iwata *et al.*, 1994; Vollmer *et al.*, 1995). It is often not possible to directly manipulate the consequences that are automatically produced by a response (for a notable exception, see Rincover, Newsom, & Carr, 1979). However, a number of investigators have developed indirect analyses designed (a) to provide additional (but indirect) empirical support for the automatic reinforcement hypothesis, (b) to rule out competing or alternative explanations of the results, and (c) to aid in the development of effective treatments (Goh *et al.*, 1995; Kennedy & Souza, 1995; Lalli, Livezey, & Kates, 1996; Piazza, Hanley, & Fisher, 1996; Thompson, Fisher, Piazza, & Kuhn, 1998; Vollmer *et al.*, 1995). Thus, when a functional analysis is inconclusive but relatively high and stable response rates are observed across all conditions, there are number of specific procedures available to further evaluate behavioral function and to identify effective treatments.

Another pattern of responding (or lack thereof) observed in inconclusive functional analyses is that response rates are relatively low or extremely variable across functional

analysis conditions (e.g., Bowman, Fisher, Thompson, & Piazza, 1997; Vollmer *et al.*, 1995). One potential reason for this pattern of responding is that the specific contingency responsible for behavioral maintenance is idiosyncratic and is not present in any of the functional analysis test conditions (e.g., Bowman *et al.*, 1997). A second potential reason is that the maintaining contingency is present, but the antecedent condition that establishes the effectiveness of the contingency as reinforcement is either not present or is present only at certain times (e.g., Kennedy & Meyer, 1996; O'Reilly, 1995; Smith, Iwata, Goh, & Shore, 1995; Wacker *et al.*, 1996). Unfortunately, when a functional analysis is inconclusive with relatively low or extremely variable response rates observed across conditions, it is less clear how the behavior analyst should proceed in attempting to identify uncommon or unique reinforcement contingencies or establishing operations.

One potential method for identifying idiosyncratic establishing operations and reinforcement contingencies that function to maintain aberrant behavior is through descriptive information collected via indirect assessments (e.g., rating scales, interviews; Horner & Day, 1991; O'Neill, Horner, Albin, Storey, & Sprague, 1990) or direct assessments (e.g., antecedent-behavior-consequence data; Lalli, Browder, Mace, & Brown, 1993; Mace & Lalli, 1991; Sasso *et al.*, 1992). Some investigators have suggested that formal descriptive assessments should be routinely conducted prior to experimental analyses (e.g., Lalli *et al.*, 1993; Mace & Lalli, 1991). However, others have argued that the utility of combining descriptive assessments and experimental analyses has not been clearly established, in part because interviews and rating scales tend to be unreliable and the results of direct methods do not always correspond to those of experimental analyses (Iwata, 1994; Lerman &

Iwata, 1993; Sturmey, 1994). Therefore, we have attempted to use descriptive information conservatively, primarily when the results of an experimental analysis are inconclusive and responding was not maintained at consistent levels in any of the conditions. When this occurs, it may be more likely that either the contingency responsible for behavioral maintenance or the relevant establishing operation was not present in any of the test conditions of the analysis. In such cases, looking for unique antecedents and consequences relevant to behavioral function via descriptive assessments may be warranted. Whether this conservative approach to integrating descriptive and experimental analyses is any better or worse than other approaches remains unknown.

In the current investigation, an experimental functional analysis using methods similar to those described by Iwata et al. (1982/1994) produced inconclusive results with the 2 participants. Descriptive assessments then were conducted to help generate hypotheses regarding potential idiosyncratic operant functions of destructive behavior. These assessments suggested that the most common antecedent associated with destructive behavior involved the combination of two events: (a) The individuals were engaged in high-probability (and presumably high-preference) activities, and (b) a staff member issued a request for the participant to stop that activity (e.g., "Stop climbing") or to initiate an incompatible response (e.g., "Come sit at the table"). Neither of the antecedents (a high-probability activity or staff issuing requests) alone appeared to be correlated with an increased probability of destructive behavior. The descriptive assessments also suggested that the most common consequence was termination of the request.

A descriptive assessment that suggests that problem behavior is occasioned by requests and produces termination of those requests usually leads to the hypothesis that the be-

havior is maintained by negative reinforcement in the form of escape from nonpreferred demands (Lalli & Goh, 1993). However, Neef and colleagues showed that compliance with requests to terminate an activity (e.g., "Stop teasing your sister"), which they labeled "don't" requests, belonged to a separate operant class than compliance with requests to initiate an activity (e.g., "Stack the blocks"), which they called "do" requests (Neef, Shafer, Egel, Cataldo, & Parrish, 1983). Similarly, breaks from work (or free time) can function as either negative or positive reinforcement for compliance or problem behavior (e.g., Iwata, Pace, Kalsher, Cowdery, & Cataldo, 1990; Rortvedt & Miltenberger, 1994; Zarcone, Fisher, & Piazza, 1996). Based on the results of these previous investigations and the observation that requests occasioned destructive behavior from these participants only when they were engaged in a high-probability (preferred) activity, we hypothesized that the behavior was maintained by positive reinforcement (i.e., the request was terminated contingent on destructive behavior and the participant then returned to a high-preference activity). We then evaluated this hypothesized function with additional experimental analyses and treatment evaluations.

## GENERAL METHOD

### *Participants and Setting*

Two individuals had been admitted to an inpatient unit specializing in the assessment and treatment of severe behavior disorders. Ike was a 13-year-old boy who had been diagnosed with mild to moderate mental retardation, attention deficit hyperactivity disorder, oppositional defiant disorder, and obesity. He was referred primarily for the treatment of physical aggression, but he also displayed verbal aggression, disruption, and dangerous behaviors. He was ambulatory, could follow two- to three-step instructions

(e.g., “Stand up, push your chair under the table, and stand by me”), and generally spoke in complete sentences.

Tina was a 14-year-old girl who had been diagnosed with pervasive developmental disorder, severe mental retardation, and bipolar Type II disorder who had been referred for the treatment of physical aggression. Tina was ambulatory, could follow simple one-step instructions, and had an expressive vocabulary of approximately 50 words.

All assessment and treatment evaluation sessions were conducted either in the participant’s bedroom (functional analysis sessions for Tina) or on the living unit (all other sessions).

*Data collection and reliability checks.* Trained observers sat off to the side of the room and recorded the number of targeted responses per minute using laptop computers. For Ike, *physical aggression* was defined as hitting, kicking, pushing, pulling hair, and throwing objects (excluding furniture) at others. *Property destruction* was defined as throwing objects (not at others), breaking and tearing objects, and banging on objects. *Verbal aggression* was defined as cursing and using insulting or offensive statements. *Dangerous behavior* was defined as standing on furniture, throwing furniture, touching light sockets, and striking the ceiling with objects. Targeted appropriate behavior for Ike was appropriate communication (handing a green picture communication card to the therapist). Ike’s expressive skills would have permitted the use of a vocal communicative response. However, if a vocal communication response had been used, Ike could have requested reinforcement at any time, even when it was essential that the ongoing activity cease (e.g., termination of an ongoing activity that posed a serious risk to self or others). We often use picture cards for functional communication training (FCT) to help clients to discriminate when reinforcement is and is not available. That is, we pre-

sent the card only when reinforcement is available. This may lessen the chances that the communication response will be weakened at times when reinforcement cannot be delivered.

For Tina, *physical aggression* was defined as hitting, kicking, biting, and pulling hair. *Appropriate communication* was defined as handing a stop sign to the therapist.

Sessions were 10 min in length and were partitioned into 60 10-s intervals to calculate interobserver agreement. Exact agreement coefficients were calculated by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100%. An exact agreement was defined as both observers recording the same frequency of a target response in a given 10-s interval. For Ike, two independent observers collected data during 38% of functional analysis sessions, 50% of sessions during the “don’t” request analysis, 54% of sessions during the symmetrical “do” request analysis, and 17% of sessions during the FCT treatment evaluation. For Tina, interobserver agreement was assessed during 45% of functional analysis sessions, 47% of sessions during the “don’t” request analysis, 90% of sessions during the symmetrical “do” request analysis, and 71% of sessions during the FCT treatment evaluation. For each target response displayed by each participant in every assessment, the mean exact agreement coefficient exceeded 95% (range, 95.6% to 100%).

## PHASE 1: FUNCTIONAL ANALYSIS

### *Procedure and Design*

An analogue functional analysis was conducted using procedures similar to those described by Iwata *et al.* (1982/1994) and included demand, social attention, play, and tangible (Ike only) conditions. For each participant, functional analysis conditions were

randomly drawn and conducted in a multi-element design. Prior to the formal functional analysis, the primary caregivers for both participants were interviewed using a structured behavioral interview (Iwata, Wong, Riordan, Dorsey, & Lau, 1982). In addition, the therapists conducted informal observations of the participants on the living unit. The interview and observations were designed to obtain information regarding the history and description of the destructive behavior, its frequency, and related antecedents and consequences. The formal functional analysis was, in part, tailored to the individual participants based on the information derived from the interview and observation. As examples, the types of tasks used in the demand condition were based on these procedures, alone conditions were not included because neither participant displayed self-injurious behavior, and a tangible condition was included for Ike because it was reported that he displayed destructive behavior when preferred objects were removed.

In the demand condition, the therapist presented academic tasks (e.g., sorting, stacking) using sequential verbal, gestural, and physical prompts. Compliance with either the verbal or the gestural prompt resulted in brief praise (e.g., "nice working"), and destructive behavior resulted in termination of the task for 30 s (escape) on a fixed-ratio (FR) 1 schedule. During social attention sessions, the clients were given toys and were asked to play quietly. The therapist provided a verbal reprimand (e.g., "don't do that, you'll hurt me") for destructive behavior on an FR 1 schedule. All other responses were ignored. In the play sessions, the therapist interacted with the clients and presented praise once every 30 s contingent upon the first 5-s period in which no destructive behavior occurred, and all destructive responses were ignored. Prior to the tangible condition conducted with Ike, he was al-

lowed 2 min of access to preferred items (i.e., television, basketball, etc.). The items were removed at the start of the session and were returned to Ike for 30 s contingent upon destructive behavior on an FR 1 schedule. All other responses were ignored.

### *Results and Discussion*

Figure 1 shows the results of the functional analyses for Ike and Tina. For Ike, destructive behavior was rarely observed in any of the functional analysis conditions (i.e., near-zero rates in each condition). For Tina, near-zero rates of destructive behavior were observed in all conditions and sessions except for the first two social attention sessions. Ike displayed no destructive behaviors during the social attention, demand, and tangible conditions, and a mean rate of 0.1 responses per minute (range, 0 to 0.2) occurred in the play condition. Tina displayed a mean rate of 1.2 responses per minute (range, 0 to 6.5) in the social attention condition, 0.01 (range, 0 to 0.1) in play, and none in the demand condition.

## PHASE 2: DESCRIPTIVE ASSESSMENTS

### *Procedure*

First, staff members who routinely worked with Ike and Tina were interviewed and asked about the situations that typically evoked destructive behavior. Although near-zero levels of destructive behavior were observed in the demand condition of the functional analysis for both clients, staff reported that certain types of requests were consistently associated with high levels of destructive behavior. In addition, antecedent-behavior-consequence (ABC) data (Sulzer-Azaroff & Mayer, 1977) were collected during all waking hours for 32 days for Ike and 33 days for Tina. These data were then summarized by graphing the number of times destructive behavior was reported to occur



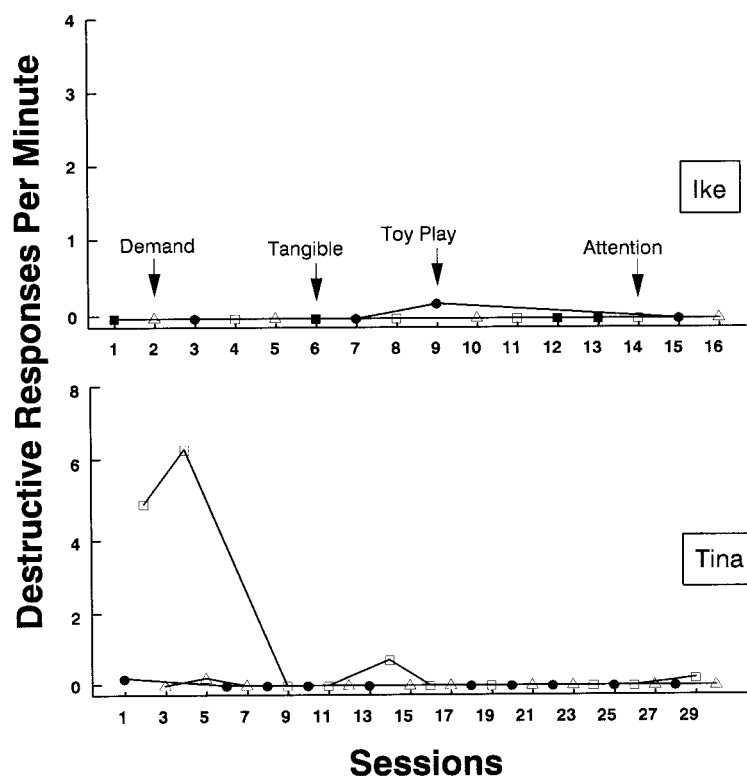


Figure 1. The rates of destructive behavior during functional analysis for Ike (top panel) and Tina (bottom panel).

in the presence of various antecedent conditions (e.g., during demands, in low-attention situations, or when tangible items were removed). For Ike, destructive behavior was reported to occur most often in the presence of demands. For Tina, destructive behavior was reported to occur most often during low-attention situations, followed closely by the presence of demands. Next, the therapists conducted informal observations of each participant in the situations that had been identified through the ABC data (i.e., demands for Ike, low-attention and demand situations for Tina). The purpose of these observations was to validate the ABC results and to identify specific characteristics of the situations that evoked destructive behavior (e.g., staff member interacting with another client; type of demand). These informal observations led to one hypothesis for Ike and two for Tina.

For Ike, destructive behavior consistently occurred when demands were presented that interrupted high-probability (and presumably preferred) activities. For example, watching game shows (e.g., “The Price is Right”) was a high-probability (and preferred) response for Ike, and he consistently displayed destructive behavior when he was instructed to turn off the television. Based on these observations, we hypothesized that demands that interrupted an ongoing preferred activity evoked destructive behavior. We surmised that demands did not evoke destructive behavior during the functional analysis because they did not interfere with a preferred activity.

For Tina, destructive behavior also consistently occurred when demands were presented that interrupted high-probability activities. However, for Tina (unlike Ike), these same demands usually involved a fair

amount of gross motor movement. For example, during her free time, Tina frequently stood by a door to the living area and looked out of the window. When a staff member requested that she move away from the door to allow other clients through, she often engaged in destructive behavior. Based on these observations, we developed two hypotheses regarding the function of Tina's destructive behavior. One was that instructional demands evoked problem behavior primarily when they interrupted an ongoing preferred activity. The second hypothesis was that demands involving gross motor activity evoked destructive behavior. We surmised that demands issued during the functional analysis did not evoke destructive behavior because they neither interrupted a preferred activity nor involved gross motor activity.

One potentially important difference between the observations conducted during the descriptive assessment and those conducted prior to the initial functional analysis was that the therapists actually probed a variety of demands with the participants. These probes were conducted to determine which demands were associated with destructive behavior (as opposed to simply observing the demands that were presented on the living unit). Thus, the observations conducted as a part of the descriptive assessment were more structured and more focused on identifying specific aspects of demands that might evoke destructive behavior than were the observations conducted prior to the first functional analysis.

### PHASE 3: ANALYSIS OF "DON'T" REQUESTS

#### *Procedure and Design*

Multielement analyses were conducted to test the hypotheses generated from the results of the descriptive analyses regarding the function of each participant's destructive be-

havior. For both participants, a test condition ("don't" requests) and a control condition were included to test the hypothesis that the function of destructive behavior was to terminate demands that interfered with an ongoing preferred activity. For Tina, "don't" requests generally involved higher levels of gross motor activity than did the demands presented in the functional analysis (Phase 1). Therefore, another test condition (matched "do" requests) was included to test the hypothesis that her destructive behavior was maintained by escape from demands involving higher levels of gross motor activity (i.e., increased response effort). The demands presented in this condition involved higher levels of gross motor activity (matched to "don't" requests condition), but the requests did not interfere with a high-preference activity.

Prior to the start of each session in the "don't" requests condition, the client was given a 2-min period of free time, during which a variety of materials and activities were available (e.g., playing with toys, watching TV, looking out of the window, sitting, walking, pacing, engaging in stereotypes). There were no programmed prompts or consequences for any responses. At the start of the session, the therapist issued a "don't" request that interrupted the high-probability response the client had chosen to engage in (e.g., if Tina was standing by the door, the therapist delivered the request, "Don't stand by the door"). If the client complied with the request within 5 s of the verbal prompt, brief praise was delivered (e.g., "nice listening"). If compliance did not occur within 5 s of the verbal prompt, the client was physically guided to complete the task (e.g., Tina was guided away from the doorway, Ike was guided to turn off the television). Thus, as used here, a "don't" request involved a verbal prompt and, if necessary, a physical prompt. However, if the client engaged in destructive behavior at any time

during the prompting sequence, all prompts were immediately terminated for 30 s and the client was allowed to resume the activity (e.g., Tina was allowed to stay in the doorway). Following either compliance or a physical prompt, the client was allowed a brief period (30 s for Ike and 10 s for Tina) to engage in another high-probability response, and no requests were delivered during that time. The number of “don’t” requests delivered was dependent on the rate of compliance with the therapist’s prompts, the rate of destructive behavior, and how quickly the participant began another activity.

During the control condition, the participants had free access to the same materials and activities that were available in the “don’t” requests condition, but no requests were issued. That is, the participants could engage in high-probability free-operant responses throughout the session, without interruption. There were no programmed prompts or consequences for any response.

The matched “do” requests condition was designed to control for the amount of movement typically involved in the “don’t” requests issued to Tina. That is, in the initial functional analysis, academic demands were delivered while Tina and the therapist were seated at a table. By contrast, many of the demands in the “don’t” requests condition typically involved initiation or termination of gross motor movement (e.g., “Stop pacing” or “Move away from the window”). Therefore, the matched “do” requests condition was designed to control for this difference. This condition was identical to the demand condition from the functional analysis with one exception: A percentage (approximately 50%) of the demands involved gross motor movement similar to the demands in the “don’t” requests condition (e.g., standing up and moving to a different area of the table). The actual percentage of high-movement demands in a matched “do” requests session was yoked to the preceding

“don’t” requests session (i.e., the number of high-movement demands divided by the total number of demands times 100%). The number of matched “do” requests delivered was dependent on the rate of compliance with the therapist’s prompts, the rate of destructive behavior, and how quickly the participant began another activity.

### *Results and Discussion*

The rates of destructive behavior during the “don’t” requests, control, and matched “do” requests conditions (Tina only) are presented in Figure 2. For both participants, the rates of destructive behavior were high and stable in the “don’t” requests condition (both  $M_s = 2.4$ ; range, 1.5 to 4.3 for Ike, 1.3 to 2.9 for Tina). By contrast, destructive behavior remained at near-zero levels in the control condition for both participants ( $M_s = 0.02$  and 0.01 for Ike and Tina, respectively) and also in the matched “do” requests condition conducted with Tina ( $M = 0.04$ ; range, 0 to 0.2). Thus, termination of the sequence of prompts involved in the “don’t” requests functioned as reinforcement for destructive behavior, whereas termination of the prompts involved in “do” requests did not (i.e., the “do” requests presented in the first functional analysis and the matched “do” requests for Tina in this analysis).

An hypothesis suggested by Neef *et al.* (1983) was that the functional antecedent and consequent stimulus was the high-probability (and presumably preferred) response that occurred before and after “don’t” (but not “do”) requests. That is, the participants in the Neef *et al.* study were generally engaged in a high-probability (preferred) response prior to a “don’t” request, and non-compliance allowed them to continue that preferred response. Similarly, in the current investigation, destructive behavior following a “don’t” (but not a “do”) request allowed the participants to resume the high-probability activity. Thus, in both studies, when



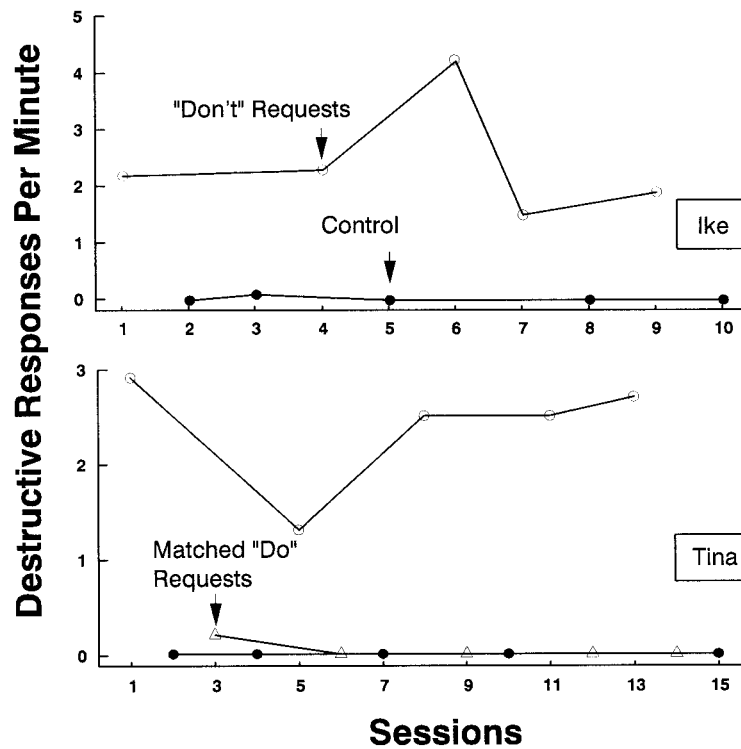


Figure 2. The rates of destructive behavior during the "don't" request analysis for Ike (top panel) and the "don't" and matched "do" request analysis for Tina (bottom panel).

"don't" requests were issued, the presumed automatic reinforcer for the high-probability response may have effectively competed with the programmed consequence for compliance (praise).

This latter hypothesis suggests that whether the demand is phrased as a "do" or a "don't" request may be incidental to the probability of compliance or destructive behavior, and the critical variable is whether the request interferes with an ongoing high-probability response. If this is true, then "do" requests that interfere or compete with an ongoing high-probability response should produce levels of compliance or destructive behavior similar to "don't" requests (and dissimilar from "do" requests that do not interfere with an ongoing activity). The analysis conducted in Phase 4 was designed to test this second hypothesis. In Phase 4, the "don't" requests issued in Phase 3 were re-

phrased as symmetrical "do" requests (Ducharme & Worling, 1994; e.g., "Stop pacing" was rephrased as "Stand still"), and the effects of terminating symmetrical "do" requests contingent on destructive behavior were evaluated.

#### PHASE 4: SYMMETRICAL "DO" REQUESTS

##### *Procedure and Design*

A multielement analysis was conducted to test the hypothesis that these participants engaged in destructive behavior to terminate symmetrical "do" requests. There were two conditions, a control condition and one in which destructive behavior resulted in termination of all prompts associated with the symmetrical "do" requests for 30 s.

The control condition was identical to the

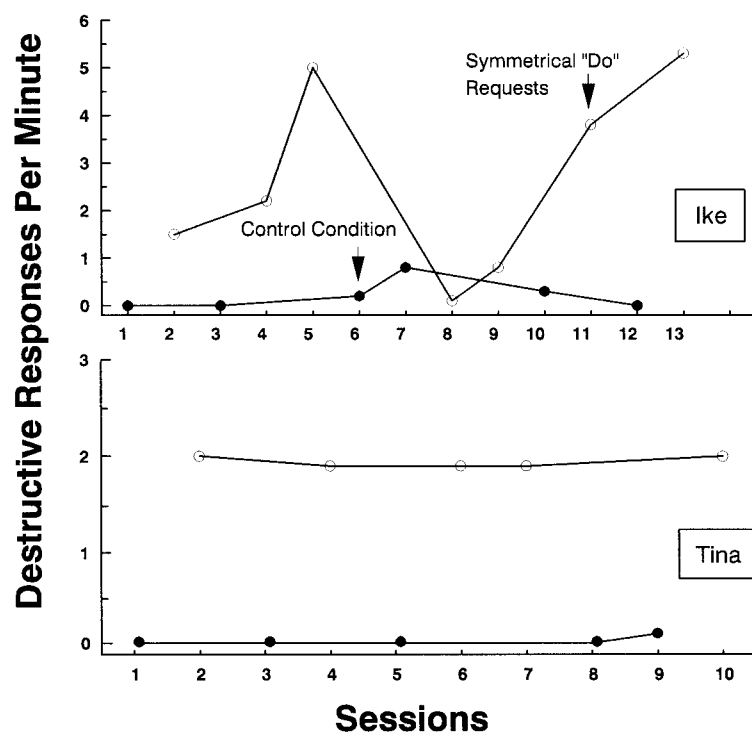


Figure 3. The rates of destructive behavior during the symmetrical “do” request analysis for Ike (top panel) and Tina (bottom panel).

one conducted in Phase 3. The symmetrical “do” requests condition was identical to the “don’t” requests condition conducted in Phase 3 with one exception: Each “don’t” request used in the previous phase was rephrased as a symmetrical “do” request. As used here, a symmetrical “do” request involved a verbal prompt and, if necessary, a physical prompt. That is, the therapist issued a symmetrical “do” request that would result in the interruption of the activity that the client had chosen to engage in (e.g., if Tina was standing by the door, the therapist delivered the request, “Come stand by me”). If the participant complied with the symmetrical “do” request within 5 s, the therapist provided brief praise (e.g., “Nice listening”). If compliance did not occur within 5 s of the verbal prompt, the participant was physically guided to complete the task (e.g., guided to stand by the therapist, who was standing away from the door).

#### Results and Discussion

The results of the assessment of symmetrical “do” requests are depicted in Figure 3. Ike and Tina both displayed relatively high rates of destructive behavior during the symmetrical “do” requests condition (for Ike,  $M = 2.7$ , range, 0.1 to 5.3; for Tina,  $M = 1.9$ , range, 1.9 to 2.0) and low rates during the control condition (for Ike,  $M = 0.2$ , range, 0 to 0.8; for Tina,  $M = 0.002$ , range, 0 to 0.1). The results of Phase 4 clearly showed that (a) contingent termination of demands that interfered with an ongoing high-probability response functioned as reinforcement for destructive behavior, and (b) it did not matter whether the request was phrased as a “don’t” or a symmetrical “do” request (i.e., the type of request did not function as a discriminative stimulus). The critical variable was that the sequence of prompts (i.e., a verbal prompt and, if necessary, a physical

prompt) involved in "don't" requests and symmetrical "do" requests effectively interrupted the ongoing high-probability activity. Interruption of the high-probability activity evoked destructive behavior, and contingent termination of the prompting sequence functioned as reinforcement for destructive behavior.

#### PHASE 5: TREATMENT EVALUATION

##### *Procedure and Design*

During this phase, we assessed whether a treatment based on the identified behavioral function would reduce destructive behavior to clinically acceptable levels. The treatment, functional communication training (FCT) plus extinction (EXT), was compared with baseline using an ABAB design. The baseline condition was identical to the "don't" requests condition described above in Phase 3.

Following the initial baseline and prior to the first FCT plus EXT phase, training trials were conducted to teach the participants a communicative response that would result in the termination of "don't" requests. During training trials, verbal prompts alone (Ike) or in combination with gestural prompting (Tina) were used to teach the clients to hand a communication card (stop sign for Tina, green card for Ike) to the therapist in order to terminate "don't" requests. This FCT response resulted in the termination of all prompts for 30 s, and the participants were allowed to resume the preferred activity. Training sessions were partitioned into blocks of 10 trials. The FCT plus EXT phase was initiated when the participant communicated independently during 80% of the trials for three consecutive training sessions.

The FCT plus EXT condition was identical to baseline (or the "don't" requests condition from Phase 3) with two exceptions: (a) All prompts associated with the "don't"

requests were terminated for 30 s contingent on the appropriate communication response, and (b) destructive behavior was placed on extinction and thus produced no differential consequence. That is, the prompting sequence continued independent of destructive behavior, which resulted in termination of the preferred activity.

##### *Results and Discussion*

The results of the treatment evaluation comparing FCT plus EXT with baseline for Ike and Tina are depicted in Figure 4. During the initial baseline, destructive behavior averaged 2.4 (range, 1.6 to 4.22) and 2.3 (range, 1.5 to 2.9) responses per minute for Ike and Tina, respectively. In the next phase, FCT plus EXT reduced destructive behavior to means of 0.43 (range, 0.0 to 1.7) and 0.49 (range, 0 to 0.7) responses per minute for Ike and Tina, respectively. During the return to baseline, destructive behavior increased to means of 5.3 (range, 4.2 to 6.3) for Ike and 1.7 (range, 1.7 to 1.7) for Tina. When FCT plus EXT was reintroduced, destructive behavior decreased to 0.3 (range, 0 to 0.7) for Ike and to 0.12 (range, 0 to 0.3) for Tina. During both FCT plus EXT phases, appropriate communication was high and stable for both participants (all  $M_s = 1.5$ ). Appropriate communication was not possible during baseline phases because relevant pictures cards were not present.

The rate of requests delivered during baseline and treatment was not identical, and this may have had some effect on the results. The rate at which requests were delivered was dependent on the rate of compliance with the therapist's prompts, the rate of destructive behavior (baseline) or communication (FCT plus EXT), and how quickly the participant began another activity. In spite of this, for Tina, the mean rate of requests during baseline and FCT plus EXT were remarkably similar ( $M_s = 1.8$  and 1.7, re-

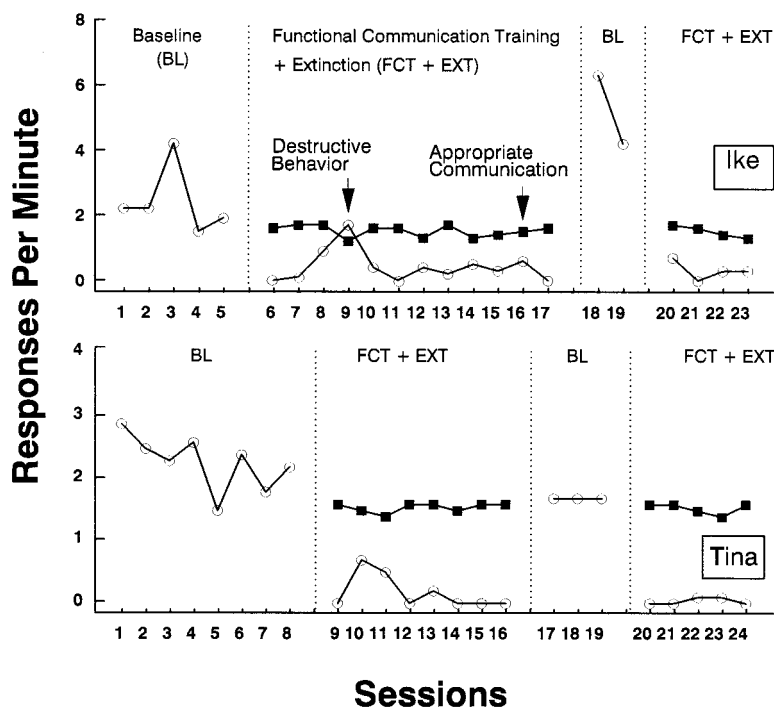


Figure 4. The rates of destructive behavior and communication during the treatment evaluation for Ike (top panel) and Tina (bottom panel).

spectively). Data were not collected on the rate of requests for Ike.

After the completion of Phase 5, FCT plus EXT was incorporated into each participant's daily routine throughout all waking hours. Prior to implementation across the day, the treatment was modified to make it more practical for the natural environment. During Phase 5, Ike and Tina could terminate each "don't" request delivered, which did not address the issue of noncompliance. Therefore, to facilitate an increase in compliance, the availability of reinforcement was restricted in the following way. The communication card continued to be made available concurrently with each initial request. Appropriate communication resulted in the termination of the prompting sequence and 30 s of continued access to the preferred activity. However, following the 30-s interval of reinforcement, the request to terminate the activity was repeated in the absence of

the communication card. Compliance with the next "don't" or symmetrical "do" request produced praise from the therapist and non-compliance resulted in continuation of the prompting sequence, which in turn resulted in termination of the ongoing preferred activity. That is, the communication response allowed the participants to continue the preferred activity for a short period (30 s) but not indefinitely.

Interestingly, re-presentation of a "don't" request with the FCT card absent usually did not evoke destructive behavior. We speculate that the presence of the card may have functioned as a discriminative stimulus, which signaled the availability of reinforcement for communication. By contrast, the absence of the card may have signaled the unavailability of reinforcement (i.e., extinction) for both communication and destructive behavior. In addition, this signal may have mitigated the evocative effects of the

ensuing deprivation condition (i.e., termination of the preferred activity), just as intermittent shock is less aversive and intermittent food is more reinforcing when it is signaled rather than unpredictable (Badia, Culbertson, & Harsh, 1973; Lewis, Lewin, Muehleisen, & Stoyak, 1974). Alternatively, it is possible that the alternating presence and absence of the card was the equivalent of an FR 2 schedule of reinforcement (i.e., every other "don't" request could be terminated via communication), which may have been sufficient to maintain low levels of destructive behavior.

### GENERAL DISCUSSION

The functional analyses conducted during Phase 1, using methods similar to those described by Iwata et al. (1982/1994), produced inconclusive results. For Ike, destructive behavior was rarely observed in any of the functional analysis conditions. For Tina, high rates of destructive behavior were observed during the first two social attention sessions, but thereafter the rates in all conditions were at near-zero levels. Based on these findings, we hypothesized that the antecedent conditions that evoked destructive behavior (i.e., the relevant establishing operations) or the consequences that maintained the behavior were not present in any of the functional analysis conditions. Results of the descriptive assessments conducted in Phase 2 suggested that destructive behavior occurred primarily when a staff member or parent issued a request to the participant that interfered with an ongoing high-probability behavior (i.e., the sequence of prompts involved in "don't" or symmetrical "do" requests). Subsequent experimental analyses in Phases 3 and 4 showed that destructive behavior was maintained by contingent termination of the sequence of prompts associated with "don't" and symmetrical "do" requests but not by termination of the

prompts associated with topographically similar "do" requests. That is, contingent termination of a group of the same (or highly similar) requests maintained destructive behavior, but only if the demands were issued while the participant was engaged in a high-probability activity. These results suggest that termination of "don't" and symmetrical "do" requests may have functioned as positive reinforcement for destructive behavior (i.e., termination of these requests allowed the individual to resume the preferred activity). Alternatively, it is possible that the ongoing preferred activity acted as an establishing operation and increased the aversiveness of the request. Finally, in Phase 5, a treatment (FCT plus EXT) developed on the basis of these analyses reduced destructive behavior to near-zero levels.

The current results contribute to the literature on functional analysis and treatment of destructive behavior in several potentially important ways. First, the results add to the growing body of literature that suggests that descriptive assessment data may be useful (a) for generating hypotheses regarding idiosyncratic antecedent and consequent stimuli that evoke or maintain aberrant behavior and (b) for developing specific experimental analyses to test those hypotheses (Horner & Day, 1991; Lalli et al., 1993; Lalli & Goh, 1993; Mace & Lalli, 1991; O'Neill et al., 1990; Sasso et al., 1992). A second, more focused, experimental analysis then was developed (based on the results of the descriptive assessment) to test whether this hypothesized reinforcer actually maintained destructive behavior.

The approach used in the current investigation was somewhat different from other investigations that have integrated descriptive assessments and experimental functional analyses (e.g., Mace & Lalli, 1991). We first tested the effects of the consequences that most often maintain aberrant behavior (e.g., escape and social attention) under the con-



ditions that commonly evoke such behavior (presence of nonpreferred demands, deprivation of attention or stimulation; see Carr, 1977, for a discussion). In addition, a tangible positive reinforcement condition was included in the first functional analysis with Ike because we observed that his care providers often gave him preferred items following destructive behavior. An alone condition was not included for either participant because aggression was the primary target behavior. After these common consequences were given a reasonable test and ruled out as potential reinforcers for destructive behavior, we then used descriptive assessment data to help generate hypotheses regarding potential idiosyncratic functions.

Combining the two types of assessments (descriptive and experimental) is often done to help to determine how much confidence one should have in the identified function of problem behavior (Lalli & Goh, 1993). That is, the experimental analysis determines which contingencies maintain problem behavior and the descriptive assessments help to determine which contingencies actually occur in the natural environment; one would have the most confidence when both sources of information implicate the same operant function (Mace, Lalli, & Lalli, 1991). However, when the two sources of information disagree regarding the function of problem behavior, it is unclear how one should proceed in developing a treatment (i.e., should treatment be based on the descriptive assessment, the experimental analysis, or some confluence of the two discrepant sources of information?).

Another reason for combining these two types of assessments is to develop more specific and streamlined experimental analyses based on the results of the descriptive assessment (Iwata, 1994; Lalli & Goh, 1993). The methods used in the current study differ from this approach in that the specific experimental analysis that was developed based

on the results of the descriptive assessment was conducted only after we tested for the more common functions of aberrant behavior (escape and social attention for both participants and tangible positive reinforcement for Ike).

Our assessment probably would have been more streamlined had we simply completed the descriptive assessment and the second experimental analysis, but we would not have ruled out the most common functions of aberrant behavior, which seems important to do (see Iwata, 1994, for a discussion). That is, descriptive assessments, even those that employ direct observation methods, often produce results that are discrepant from experimental functional analyses (e.g., Lerman & Iwata, 1993; Mace & Lalli, 1991). Thus, it may be tenuous to conclude that attention and escape are not functional reinforcers based solely on the results of a descriptive assessment.

A second potential contribution of the current findings is that they suggest that termination of "don't" (and symmetrical "do") requests may function as positive reinforcement for destructive behavior. It is generally assumed that destructive behavior is maintained by negative reinforcement when it occurs primarily in response to demands (Lalli & Goh, 1993). However, the current results indicate that certain types of demands may occasion destructive behavior because they interrupt an ongoing preferred activity. This finding is similar to the one reported by Zarcone *et al.* (1996), who found that breaks from work (or free-time contingencies) functioned as reinforcement for compliance with 1 participant only when positive reinforcers were available during the break interval.

The current findings suggest that it may be important to consider the type of request that occasions or evokes destructive behavior when generating hypotheses regarding behavioral function based on either informal observations (e.g., Iwata *et al.*, 1994) or the

results of formal descriptive assessments (e.g., Mace & Lalli, 1991). From a functional perspective, the main difference between a "do" request and a "don't" request is that the individual is engaged in an ongoing free-operant activity with the latter but not with the former type of request. Symmetrical "do" requests are topographically similar to "do" requests but are functionally equivalent to "don't" requests (because they interrupt an ongoing preferred activity). Perhaps it is the case that problem behavior that occurs following "do" requests should usually lead to a negative reinforcement hypothesis, and behavior that occurs following "don't" (or symmetrical "do") requests should lead to a positive reinforcement hypothesis. That is, "don't" and symmetrical "do" requests interfere with an ongoing free-operant activity (which presumably produces automatic positive reinforcement). Given that this investigation involved just 2 participants, this observation remains speculative until the current findings are replicated with a considerably larger number of participants.

Some of the high-probability responses that were interrupted by the "don't" requests were appropriate (e.g., toy play), and others were inappropriate (e.g., stereotypic pacing). It is conceivable that many forms of appropriate (e.g., toy play) and aberrant (e.g., stereotypies, rituals, pica) behavior are high-probability responses that are maintained by the automatic consequences they produce (e.g., oral stimulation for pica; Favell, McGimsey, & Schell, 1982; Piazza et al., 1998). Interrupting these automatically maintained responses (e.g., through response blocking or a "don't" request) may evoke other aberrant behaviors like aggression or SIB. If these latter responses result in termination of the interruption procedure and allow the individual to resume the high-probability response (e.g., resumption of toy play or pica), this may function to maintain

the secondary responses (e.g., aggression or SIB). It is well established that contingent access to a high-probability response can function as positive reinforcement for another response (e.g., Premack, 1962). Thus, methods similar to the ones applied in this investigation might be used with individuals who frequently engage in stereotypies, rituals, or pica, and who display other forms of aberrant behavior (e.g., aggression, SIB) when the high-probability responses are interrupted.

One potential limitation of the current study is that we did not assess the function of the high-probability responses that were interrupted with "don't" requests. We simply assumed that these responses persisted in the absence of social contingencies because the participants frequently engaged in these responses without prompting or programmed consequences. Future research on this topic might include a series of alone conditions (Vollmer et al., 1995) to better determine whether the high-probability responses were maintained in the absence of social contingencies.

Another potential limitation is that we did not completely rule out the possibility that termination of the sequence of prompts associated with "don't" and symmetrical "do" requests functioned as negative reinforcement for destructive behavior. An alternative interpretation of the results is that the high-probability response functioned as an establishing operation and increased the aversiveness of the "don't" and symmetrical "do" requests. That is, the requests may have been momentarily annoying and aversive because they were issued at a time when the individual was engaged in the high-probability activity. This alternative hypothesis could be evaluated in future research by including a condition in the analysis in which a symmetrical "do" request is terminated contingent on destructive behavior but the individual is not allowed to resume the high-

probability response. This condition then could be compared to the symmetrical “do” condition (wherein the request is terminated and the individual is allowed to resume the high-probability response). The relative rates of destructive behavior in these two conditions would provide a more definitive test as to whether termination of the sequence of prompts associated with “don’t” and symmetrical “do” requests functions as negative reinforcement (removal of a request that is momentarily aversive) or positive reinforcement (due to resumption of the high-probability activity).

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*STUDY QUESTIONS*

1. What two features of the Iwata *et al.* (1982/1994) functional analysis methodology distinguish it from others?
2. Describe two uninterpretable patterns of responding that might emerge during a functional analysis and their probable causes.
3. What was the rationale for using the picture card as the communicative response? How could the investigators have used a vocal response as the communicative response while maintaining the main advantage of the picture card?
4. What type of descriptive assessment procedures were used, and what hypotheses were generated as a result of the assessment?
5. Describe all of the contingencies in effect during the “don’t” request analysis.
6. What is a symmetrical “do” request, and what was the purpose of the symmetrical “do” request condition?
7. Summarize the results obtained during the “don’t” and “do” request analyses (see Figures 2 and 3). What conclusions can be drawn from these data?
8. Describe the components of the intervention and how it was later modified to enhance practicality.

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