

*BEHAVIORAL ECONOMIC INFLUENCES ON
TREATMENTS DESIGNED TO DECREASE
DESTRUCTIVE BEHAVIOR*

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In behavioral economics terms, response allocation is viewed as an exchange between the price of and the demand for reinforcers associated with various responses. In this study, behavioral economics principles were used to develop and evaluate a treatment package that reduced destructive behavior to zero while communication and compliance were increased.

DESCRIPTORS: behavioral economics, destructive behavior, extinction, functional analysis, negative reinforcement, punishment, response effort

In behavioral economics terms, response allocation is viewed as an exchange between the price of and the demand for reinforcers associated with various responses (Allison, 1983). Because human environments are typically open economies with multiple sources of reinforcement, appropriate and aberrant responses should produce reinforcers with elastic demand functions. This means that small increases in the price of one reinforcer may increase consumption of a substitutable reinforcer that serves an equivalent function. For example, Horner and Day (1991) showed that functional communication training (FCT) was less effective when the alternative communication response was more effortful (i.e., a higher price) or produced a lower rate of or less immediate reinforcement (i.e., decreased demand) than problem behavior. Studies like this one are important because they show the potential effects of delivering delayed,

infrequent, or less preferred reinforcers for appropriate behavior, as sometimes occurs in natural human environments. The current report adds to this research by showing interactive effects of several variables (response effort, reinforcer quality, extinction, and punishment) and illustrating how the relative effects of these variables may be described in behavioral economics terms.

GENERAL METHOD

Participant and Setting

Ann was 12 years old and had been diagnosed with moderate mental retardation and oppositional defiant disorder. Sessions occurred in a treatment room (8 m by 12 m) with a one-way mirror.

Data Collection and Interobserver Agreement

Destructive behaviors were defined as self-injury (head hitting, hand biting, head banging), aggression (hitting, pinching, kicking, scratching, hair pulling), and disruption (hitting, kicking, throwing, or overturning objects). Compliance was defined as completion of a requested act after a verbal or modeled prompt. Communication was defined as touching one of two cards (one for escape and one for tangible reinforcement).

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Two independent observers scored target responses in 42% of sessions, and mean exact agreement coefficients exceeded 90% for all target responses. All sessions were 10 min in length, and four to eight sessions were conducted per day.

FUNCTIONAL ANALYSIS

Procedure

Functional analysis procedures were similar to those of Iwata, Slifer, Dorsey, Bauman, and Richman (1982/1994) except that an "interrupt" condition was included, which was identical to the demand condition except that demands were presented when Ann was engaged in a preferred activity; destructive behavior produced a 30-s break with access to the preferred activity.

Results and Discussion

The results of the functional analysis (Figure 1, Panel 1) show that destructive behavior was consistently higher in the demand and interrupt conditions relative to other conditions, indicating that escape (and perhaps tangible reinforcement) maintained this behavior. The three subsequent analyses were designed to assess the effects of various treatments in the demand condition from a behavioral economics perspective (i.e., price or demand manipulations).

TREATMENT ANALYSIS 1

Procedure

In the label of each treatment condition, the consequence for destructive behavior is listed first and the consequence for communication is given second. During Treatment Analysis 1, we assessed the effects of increasing the demand for communication (by altering reinforcer quality) and the price of communication (by altering response effort). During escape/escape (esc/esc), Ann was prompted to complete instructional tasks, and compliance resulted in praise and presentation of the next task; destructive be-

havior and communication each produced a 30-s break from the task. Escape/tangible (esc/tan) was identical except that communication produced a 30-s break with access to a tangible reinforcer (identified via a stimulus choice assessment; Fisher et al., 1992). During the zero response effort phases, either the FCT escape card (in esc/esc) or the FCT tangible card (in esc/tan) was available throughout the session. During the fixed-ratio (FR) 1 response effort phases, the respective FCT cards were presented on an FR 1 schedule for compliance (i.e., compliance produced the card; touching the card produced reinforcement).

Results and Discussion

The results of Treatment Analysis 1 (Figure 1, Panel 2) show that both esc/esc and esc/tan reduced destructive behavior to near zero when response effort was zero, but destructive behavior increased less in esc/tan when response effort was increased to one (i.e., FR 1 for compliance). Thus, increasing the price of the reinforcer for communication (increasing response effort) shifted responding away from communication and toward destructive behavior, but this shift was mitigated in esc/tan by the increased demand for the tangible reinforcer for communication.

TREATMENT ANALYSIS 2

Procedure

We increased response effort for compliance further while maintaining the increased demand for the FCT reinforcer (escape plus tangible) relative to the reinforcer for destructive behavior (escape). In the first phase, destructive behavior produced a 30-s break; communication produced a 30-s break either with (esc/tan) or without (esc/esc) tangible reinforcement. Access to the FCT card was provided contingent on compliance on FR schedules, which determined the level of response effort. Response effort was in-

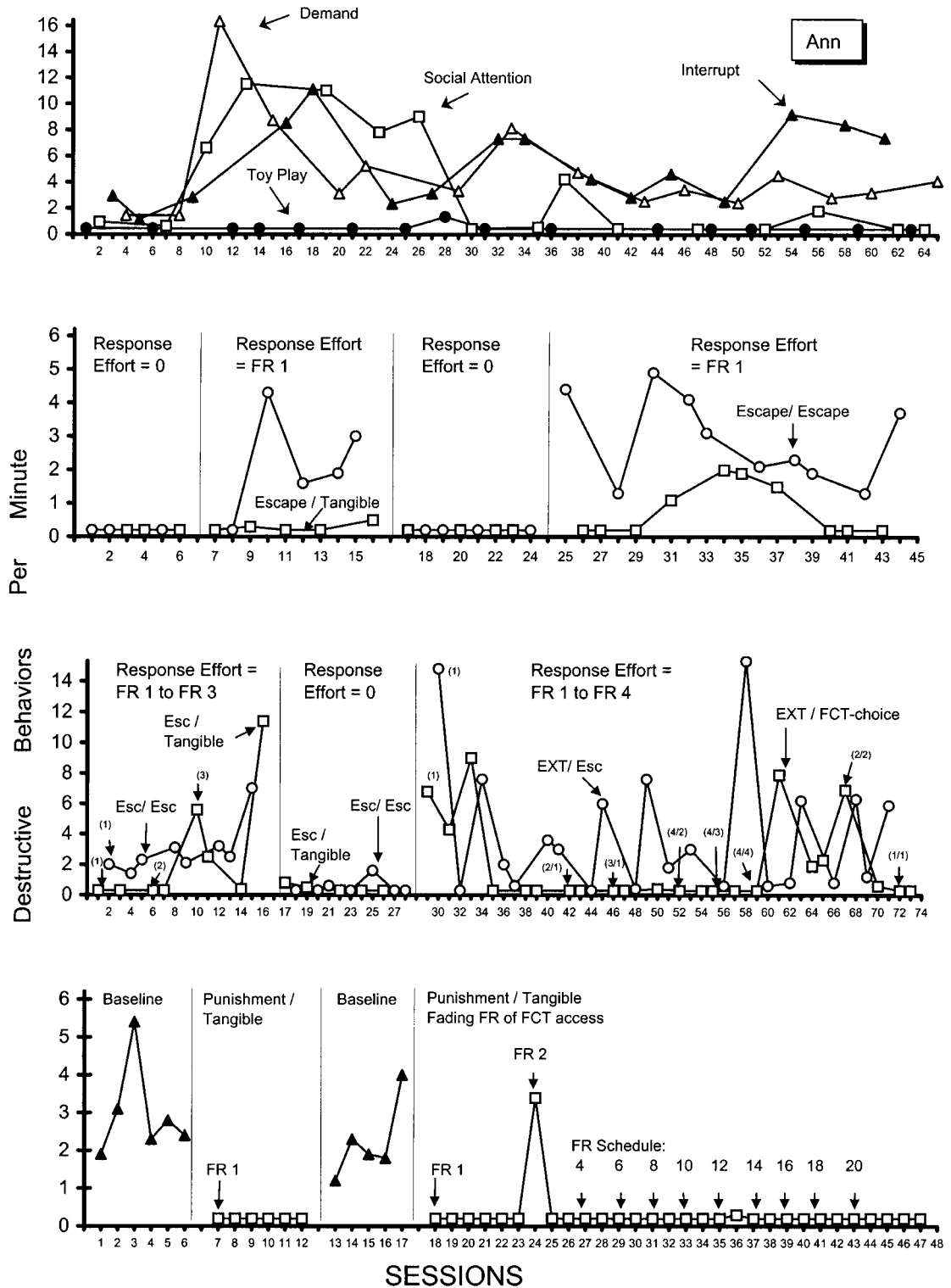


Figure 1. Rates of destructive behavior during the functional analysis (Panel 1) and the three treatment analyses evaluating the effects of response effort, reinforcer quality, extinction, and punishment (Panels 2, 3, and 4). Note that the ordinates differ across panels.

creased across sessions by increasing the response requirements necessary for the FCT to become available (e.g., FR 1, FR 2) after two consecutive sessions in which destructive behavior was at least 90% lower than the mean of demand and interrupt sessions of the functional analysis. Because destructive behavior increased in both conditions as response effort increased, we reduced the response effort to zero in the second phase (i.e., FCT card was always available). In the final phase, we decreased the demand associated with destructive behavior by placing it on extinction (ext). Also, the esc/tan condition was changed to an esc/FCT choice condition by presenting the escape card continuously and the tangible card after the requisite number of demands had been completed (thus offering a choice between a lower and higher priced reinforcer for communication).

Results and Discussion

In Treatment Analysis 2 (Figure 1, Panel 3), further increases in response effort (or the price associated with communication) resulted in increases in destructive behavior in esc/esc, esc/tan, ext/esc, and ext/tan. Thus, it was not possible to substantially increase the amount of work Ann completed, even when communication produced a higher quality reinforcer and destructive behavior was on extinction (in ext/tan), perhaps due to an inelastic demand function for destructive behavior. Nevertheless, rates of destructive behavior were generally lower when the higher quality reinforcer was present (in esc/tan and ext/tan) relative to when it was absent (in esc/esc and ext/esc).

TREATMENT ANALYSIS 3

Procedure

Because the increases in response effort were associated with high or variable rates of destructive behavior, even when it was on extinction, we assessed the effects of increas-

ing the relative costs associated with destructive behavior by adding a punishment (pun) component. Punishment could potentially alter the elasticity of the demand function for destructive behavior. In the first and third phases, destructive behavior produced escape for 30 s and the FCT card was unavailable (i.e., demand condition from the functional analysis). In the second and fourth phases, destructive behavior produced punishment (i.e., Ann was physically guided to complete the demand five times) and communication produced a 30-s break with tangible reinforcement. Compliance produced access to the FCT card according to the fading schedule described above.

Results and Discussion

In Treatment Analysis 3 (Figure 1, Panel 4), increasing the price of destructive behavior by adding a punishment procedure (in pun/tan) resulted in near-zero levels of destructive behavior and facilitated increases in response effort, suggesting that the demand function for destructive behavior became more elastic. In the final sessions, the FCT card was presented and the 30-s break with tangible reinforcement was available only after Ann had completed 20 demands.

GENERAL DISCUSSION

These results are important because they show how several variables can interact to influence response allocation between appropriate and destructive behavior. The increased demand for a higher quality (tangible) reinforcer became evident only as response effort increased (i.e., as the FR schedule for compliance increased). Increases in price (as the FR schedule increased) partially overrode the demand for the higher quality reinforcer, and destructive behavior increased. Decreasing the demand associated with destructive behavior by placing this response on extinction did not counteract the

influences of increasing response effort. Increasing the price associated with destructive behavior by adding a punishment procedure overrode the effects of response effort and allowed us to rapidly increase the amount of work Ann completed.

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