

*ATTENTION AS AN ESTABLISHING OPERATION AND  
AS REINFORCEMENT DURING FUNCTIONAL ANALYSES*

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Results of functional analyses for 36 individuals whose self-injurious behavior (SIB) was maintained by attention indicated that SIB was highest during a condition in which the individual was deprived of attention (establishing operation) except as a consequence (reinforcer). Deprivation in the absence of reinforcement produced marginal increases in SIB in 5 individuals, and a relatively rich schedule of noncontingent attention produced the lowest levels of SIB. These results suggest that clearer functional analysis outcomes are likely to be obtained when test conditions contain both an establishing operation to evoke behavior as well as a reinforcement contingency to maintain it.

DESCRIPTORS: establishing operation, functional analysis, self-injurious behavior

Research on the functional analysis of behavior disorders has shown an exceptional degree of generality across results from many studies in spite of significant variations in assessment methodology. Occasionally, however, it has been shown that certain test or control conditions, or even parametric variations within a given condition, can affect the outcome of a functional analysis. For example, Fisher, Piazza, and Chiang (1996) recently showed that duration of reinforcement can exert differential control over responding during assessment.

In the methodology described by Iwata, Dorsey, Slifer, Bauman, and Richman (1982/1994), the test condition for a given behavioral function contains an establishing operation (Michael, 1982) to evoke behavior as well as a reinforcement contingency to maintain it. For example, as a test for attention-maintained behavior, the individual is deprived of attention (establishing operation) except as a consequence (reinforcer). The control condition contains neither the

establishing operation nor the reinforcement contingency: Attention is delivered frequently but on a response-independent basis. Another condition often included in the analysis is one in which the individual is observed while alone. Although designed as a test condition for behavioral maintenance in the absence of social consequences, the alone condition contains the establishing operation for attention-maintained behavior (deprivation from attention) but not the reinforcement contingency. In effect, for an individual whose behavior is maintained by attention, the alone condition amounts to extinction.

Although both antecedent and consequent events may affect behavior during a functional analysis, their relative influence has not been studied extensively. In this study, we examined a large set of data for individuals whose self-injurious behavior (SIB) was maintained by attention. By comparing data from three conditions, we sought to determine the relative influence of (a) the establishing operation and reinforcement contingency (attention condition), (b) the establishing operation but no reinforcement contingency (alone), and (c) the absence of both (play condition).

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## METHOD

The study was conducted at a day-treatment program for the assessment and treatment of SIB located on the grounds of a state residential facility. The pool of participants consisted of all individuals living at the institution who had been referred for treatment of SIB and for whom a complete set of functional analysis data was available ( $N = 111$ ). Topographies of SIB were defined for each individual, and data were collected on occurrences of SIB during 15-min sessions conducted several times per day. The mean length of assessment was 22 sessions (range, 11 to 51 sessions). Interobserver agreement was assessed during a mean of 35% of the sessions (range, 13% to 75%), and percentage agreement, based on interval-by-interval comparison of observers' records, yielded a mean score of 95.5% (range, 87.2% to 100%).

All individuals were exposed to a series of conditions (attention, demand, alone, and play) similar to those described by Iwata *et al.* (1982/1994), but only three of these conditions are relevant to the present analysis. During the attention condition, the individual had free access to leisure materials throughout the session. The experimenter ignored the individual, except to deliver attention (e.g., "Stop. Don't do that. You'll hurt yourself.") paired with physical contact (e.g., response interruption, pat on the shoulder) contingent on each occurrence of SIB. The play condition was similar to the attention condition, except that the experimenter delivered noncontingent attention to the individual on a fixed-time (FT) 30-s schedule (twice per minute) and ignored occurrences of SIB. In the alone condition, the individual did not have access to leisure materials, and the experimenter was absent from the room.

Based on examination of individual data from all assessment conditions, consensus

agreement was reached about the function of each individual's SIB at the time assessment was completed. In 41 sets of data, SIB was high in the attention condition. Of these, five sets of data were excluded because they appeared to reflect the influence of multiple maintaining variables. Data for the remaining 36 individuals were included in the present analysis because results indicated that their SIB was maintained by attention.

## RESULTS AND DISCUSSION

Figure 1 shows the mean percentage of intervals in which SIB occurred during the attention, alone, and play conditions for all 36 individuals. Although varying levels of SIB were observed during the attention condition, SIB always occurred most frequently in that condition. For 31 of the 36 individuals, the lowest levels of SIB were observed during the play condition. SIB during the alone condition noticeably exceeded SIB during the play condition for 5 individuals (1, 4, 8, 13, and 15); SIB during the play condition noticeably exceeded SIB during the alone condition for 1 individual (3).

These results suggest that behavior is most likely to occur in the presence of both an establishing operation and a reinforcement contingency. The attention condition of the present study contained both of these components and consistently resulted in the highest levels of responding for individuals whose SIB was maintained by attention. To a lesser degree, the mere presence of an establishing operation may influence behavior. SIB was higher during the alone condition than during the play condition for most individuals. However, these differences were rather small because SIB usually did not exceed 10% of the intervals during either condition.

The general similarity between data obtained during the alone (establishing opera-

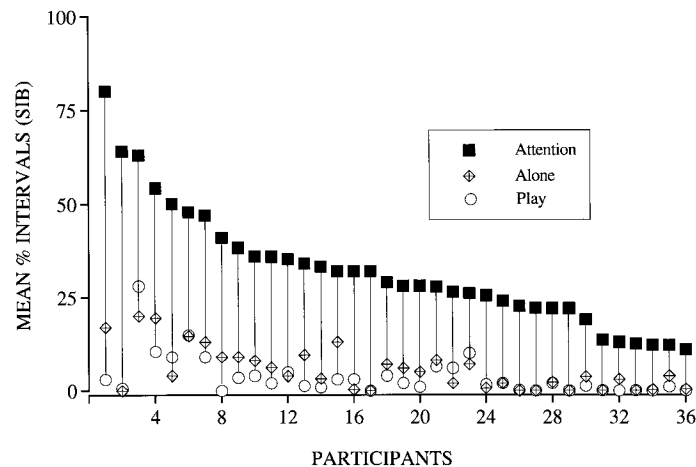


Figure 1. Mean percentage of intervals in which SIB occurred during the attention, play, and alone conditions across participants.

tion present) and play (establishing operation absent) conditions reflects a lack of maintenance and suggests that antecedent manipulations in the absence of differential consequences may yield equivocal results. In an antecedent analysis of behavior maintained by attention described by Durand and Carr (1992), attention was delivered at different rates during test and control conditions, but the conditions were not associated with differential consequences for the target behavior. Nevertheless, higher levels of the target behaviors were observed during the test condition. Differential responding could have been caused by a variety of factors, including failure to produce extinction during the test condition because of its brevity, behavioral contrast associated with different rates of attention, or systematic changes in other aspects of the experimenter's behavior across conditions. However, differential responding could not have been a function of differential consequences.

A condition not included in the present analysis was one in which the establishing operation was absent but the reinforcement contingency was present. For example, an FT 30-s schedule of attention combined with contingent attention would have been

instructive because it would exemplify a situation in which reinforcement is available to an individual who is relatively satiated (or at least not deprived) of the reinforcer. A comparison between this condition and one containing both deprivation and reinforcement (e.g., the attention condition) would reveal the extent to which changes in establishing operations produce differential responding independent of reinforcement.

Data from a number of studies on the functional analysis of behavior disorders indicate that behavior can be sensitive to manipulations in a variety of both antecedent and consequent events. Further research may help to define the functional characteristics of these manipulations and to establish optimal differences between test and control conditions, thereby leading to the development of assessment methods that are efficient as well as robust.

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