

*THE EFFECTS OF PRESESSION ATTENTION ON SUBSEQUENT
ATTENTION-EXTINCTION AND ALONE CONDITIONS*

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We examined the effects of presession levels of attention (no attention vs. continuous attention) during subsequent alone and attention-extinction conditions for an individual with severe disabilities and problem behavior. A prior functional analysis indicated that attention was a primary maintaining variable for problem behavior. Experimental control was demonstrated using a within-subject multielement design. Results indicated that presession conditions influenced responding, with higher levels of problem behavior occurring during alone and attention-extinction conditions when preceded by the no-attention presession condition. Overall, these results seem to support descriptions of the behavior-altering effects of the motivating operation (MO). Specifically, presession access seemed to influence behavior during the alone condition in which both discriminative and reinforcing stimuli were absent, suggesting a direct effect of the MO on the behavior.

DESCRIPTORS: functional analysis, problem behavior, motivating operations, autism

In a series of previous studies we piloted a methodology to demonstrate the behavior-altering effect of the motivating operation (MO) (O'Reilly, Edrisinha, Sigafoos, Lancioni, & Andrews, 2006; O'Reilly, Sigafoos, et al., 2006). These studies were conducted with

individuals with developmental disabilities who engaged in problem behavior. The methodology of these studies included three phases. In Phase 1, we isolated the reinforcing consequences for problem behavior via a consequence-based functional analysis (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994). In Phase 2, we systematically controlled access to reinforcing consequences identified in Phase 1 (no access vs. continuous access) immediately prior to the functional analysis and demonstrated that such antecedent manipulations

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doi: 10.1901/jaba.2007.731-735

could act as an MO. In Phase 3, we attempted to isolate the behavior-altering effects of the MO. We did this by placing problem behavior on extinction while controlling pre-session access to maintaining consequences, as in Phase 2. The results of this final phase demonstrated that no access to maintaining consequences immediately prior to extinction sessions produced high levels of responding during extinction. However, continuous pre-session access to maintaining consequences immediately prior to extinction sessions produced low levels of responding during extinction. Thus, the results of Phase 3 demonstrate the behavior-altering effects of the MO because reinforcement was never available during extinction sessions.

Michael (1982, 1993) has hypothesized a number of mechanisms by which this behavior-altering effect of the MO may occur. First, the MO may have a direct effect on the behavior itself. Second, the MO may have an effect on all discriminative stimuli for behavior that has been followed by that class of reinforcers.

In this study we examined both these possible mechanisms by which the MO might produce this behavior-altering effect. One individual with developmental disabilities, autism, and problem behavior participated. This individual had participated in a previous study (O'Reilly, Edrisinha, Sigafos, Lancioni, & Andrews, 2006) in which we demonstrated that problem behavior was primarily maintained by attention and that levels of pre-session access to attention (no attention vs. continuous attention) acted as an MO. In the current study we wanted to examine whether pre-session access to attention (continuous attention versus no attention) might influence the occurrence of problem behavior in subsequent attention-extinction and alone conditions. We examined the influence of the MO on problem behavior during an attention-extinction condition because discriminative stimuli (i.e., the presence of another person in the room) for attention-maintained problem behavior is present but reinforcement

(in the form of attention) is not available. We examined the influence of the MO on problem behavior during an alone condition because discriminative stimuli and reinforcement for attention-maintained problem behavior are presumably absent when a participant is alone.

METHOD

Participants, Settings, and Target Behaviors

Bruce was a 20-year-old Caucasian man who functioned at a 4-year-old level on the Vineland Adaptive Behavior Scales—Interview Edition (Sparrow, Balla, & Cicchetti, 1984). He scored in the moderate to severe range on the Childhood Autism Rating Scale (Schopler, Reichler, & Renner, 1988). He attended a school for students with autism. All sessions were conducted in a therapy room that contained a table and several chairs. No additional materials were present in the treatment room during sessions. Bruce engaged in bizarre speech, shouting, elopement (leaving his seat and attempting to leave the therapy room), and throwing himself against walls and other stationary objects (he would take on the persona of certain comic book characters). All of these response topographies were observed across the experimental conditions described below.

Functional Analysis

A functional analysis was conducted for Bruce, and the session-by-session data of this analysis are presented in graphic form elsewhere (O'Reilly, Edrisinha, Sigafos, Lancioni, & Andrews, 2006). Problem behavior occurred a mean of 84% of the time in the attention condition (range, 80% to 93%), 1% during the demand condition (range, 0% to 3%), 3% in the alone condition (range, 0% to 7%), and 1% in the play condition (range, 0% to 3%).

Data Collection, Interobserver Agreement, and Experimental Design

All sessions were videotaped and subsequently analyzed using 10-s partial-interval recording.

Interobserver agreement was conducted on approximately 50% of sessions across all conditions. Agreement was calculated using an overall (occurrence plus nonoccurrence) interval-by-interval agreement protocol. Mean interobserver agreement was 94% (range, 85% to 100%). Experimental control was demonstrated using a within-subject multielement design.

Procedure

Bruce was exposed to attention-extinction and alone conditions. Each session was 5 min long. During the attention-extinction sessions, a therapist sat in the room with Bruce but did not interact with him. During the alone sessions, he remained alone in the treatment room. He was unable to see or hear the therapist during the alone condition.

Immediately prior to each session, Bruce was exposed to either continuous attention or no attention (alone). These sessions were 15 min long. During continuous attention, a therapist interacted with Bruce continuously (e.g., "So, Bruce, what did you do over the weekend? What are some of your favorite movies?"). Comments or questions during continuous attention were delivered on a fixed-time (FT) 10-s schedule. In the no-attention session, Bruce remained by himself in the treatment room.

RESULTS AND DISCUSSION

The results of the functional analysis indicated that problem behavior was maintained by attention. The results of the pre-session manipulations on subsequent alone and attention-extinction sessions are presented in Figure 1. The pre-session conditions influenced the levels of problem behavior in both the alone and attention-extinction sessions. When Bruce was exposed to the pre-session alone condition, his levels of problem behavior were high in both the attention-extinction and alone sessions. When he was exposed to the pre-session attention condition, his levels of problem

behavior were lower in both the alone and attention-extinction sessions.

Overall, these results demonstrate two possible mechanisms by which the behavior-altering effect of the MO may occur. First, pre-session levels of attention influenced levels of problem behavior during the attention-extinction condition, which indicates that the MO can influence discriminative stimuli in the absence of reinforcing consequences. This effect replicates our previous work (O'Reilly, Edrisinha, Sigafoos, Lancioni, & Andrews, 2006; O'Reilly, Sigafoos, et al., 2006). Second, this study extends our previous research in that we have now shown that prior levels of a reinforcer can influence the occurrence of problem behavior in subsequent environments in which neither the discriminative stimulus nor the reinforcing consequence was available for that behavior (alone condition). It appears from these findings that the MO can have a behavior-altering effect on operant responding when both the discriminative stimuli and reinforcing consequences are currently absent from the environment. These preliminary findings support Michael's proposition that one of the functional properties of the behavior-altering effect of the MO is a direct effect on the behavior itself (Michael, 1982, 1993).

An alternative explanation for the current findings might be that we demonstrated a variable that influenced automatically maintained behavior (i.e., prior levels of low stimulation produce higher levels of automatically maintained behavior in subsequent alone and attention-extinction conditions). However, this explanation seems unlikely, because pre-session access to a predetermined reinforcer (i.e., attention) produced lower levels of responding in subsequent alone and attention-extinction conditions. Also, very little problem behavior occurred during the alone condition of the functional analysis, which indicates that the behavior was not maintained by automatic reinforcement.

In addition, we did not demonstrate a typical extinction effect across sessions (i.e., a gradual

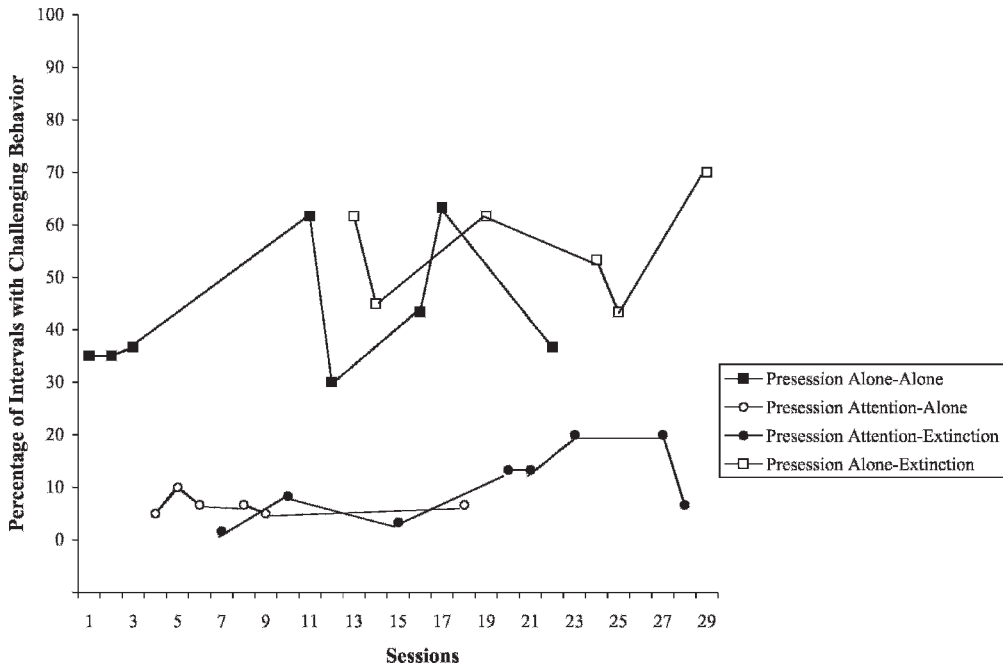


Figure 1. Percentage of intervals with problem behavior across the experimental conditions.

reduction of problem behavior in the presence of a discriminative stimulus that no longer signals reinforcement) during the attention-extinction condition. One possible reason for this is that the sessions were short (5 min) and the number of sessions was low. Another possible reason for this lack of an extinction effect might be due to our systematic manipulation of the MO prior to extinction sessions. Little research has examined the influence of MOs during extinction, and perhaps we are seeing one of the possible effects of manipulating the MO on operant responding when reinforcement is no longer available.

These results present potential implications for interventions in applied settings. The findings could be viewed as a demonstration of a relatively simple antecedent intervention to reduce attention-maintained problem behavior. Problem behavior may occur in situations in which the MO or discriminative stimulus is present but consequence-based strategies may be difficult to arrange (e.g., in inclusive settings). In such situations, an intervention designed to reduce the evocative effects of the

MO may be an unobtrusive yet effective strategy. These results also have potential implications for conducting and interpreting the findings of analogue functional analyses. It is clear from this study and from previous research that MOs can have a significant impact on the results of such assessments (cf. Berg *et al.*, 2000; O'Reilly, 1999; Roantree & Kennedy, 2006). Researchers should continue to evaluate the functional properties of MOs and to determine how best to incorporate these findings into our assessment strategies for problem behavior.

The results of this study seem to conflict with findings of other studies that have examined similar variables (i.e., Horner, Day, & Day, 1997; Worsdell, Iwata, Connors, Kahng, & Thompson, 2000). These differences across studies might be attributed in part to procedural differences. For example, Worsdell *et al.* examined the relation between MOs and various parameters of positive reinforcement contingencies during analogue functional analyses. They demonstrated that attention-maintained

problem behavior occurred only in conditions in which the MO and the reinforcement contingency were both present. The authors defined the MO procedurally but not functionally. For example, they described the MO-absent condition as an FT 30-s delivery of the identified reinforcer. Responding for 4 of the 6 participants continued to occur at high rates during the MO-absent condition (described as an FT/fixed-ratio 1 condition), indicating that the MO was present for these 4 participants. Worsdell et al. also proposed that they examined the influence of the MO during extinction (described as an FT/ignore condition). However, during the attention-extinction sessions, the therapist continued to deliver attention using differential reinforcement of alternative behavior (FT 30-s schedule). These sessions may not be an optimal method to examine the influence of the MO on extinction, because reinforcement continues to be delivered (albeit on an FT schedule). In our attention-extinction sessions, the therapist did not interact with the participant. That is, no attention was delivered. This absence of attention, which was shown to be a reinforcer, may produce a clearer picture of the functional properties of the MO during extinction.

Horner et al. (1997) demonstrated that problem behavior did not occur when the MO was in effect (e.g., sleep deprivation, cancelled trips) but the discriminative stimuli and reinforcing consequences were absent (e.g., instructional correction and escape from task). This contradicts our findings; we demonstrated problem behavior in the presence of the MO while the discriminative stimuli and reinforcers for that behavior were apparently absent. At present we are unable to explain this discrepancy. Some points of difference in the studies include the function of behavior under investigation (e.g., Horner et al. examined negatively reinforced behavior in 2 of the 3 participants, whereas we addressed positively reinforced behavior) and the nature of the MOs (Horner et al. examined interruption in activ-

ities and sleep deprivation, whereas we examined levels of pre-session access to an identified reinforcer). Clearly, further research is needed to clarify the functional properties of the MO.

REFERENCES

- Berg, W. K., Peck, S., Wacker, D. P., Harding, J., McComas, J., Richman, D., et al. (2000). The effects of pre-session exposure to attention on the results of assessments of attention as a reinforcer. *Journal of Applied Behavior Analysis, 33*, 463–477.
- Horner, R. H., Day, M. H., & Day, J. R. (1997). Using neutralizing routines to reduce challenging behaviors. *Journal of Applied Behavior Analysis, 30*, 601–613.
- Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis, 27*, 197–209. (Reprinted from *Analysis and Intervention in Developmental Disabilities, 2*, 3–20, 1982)
- Michael, J. (1982). Distinguishing between discriminative and motivational functions of stimuli. *Journal of the Experimental Analysis of Behavior, 37*, 149–155.
- Michael, J. (1993). Establishing operations. *The Behavior Analyst, 16*, 191–206.
- O'Reilly, M. F. (1999). Effects of pre-session attention on the frequency of attention-maintained behavior. *Journal of Applied Behavior Analysis, 32*, 371–374.
- O'Reilly, M. F., Edrisinha, C., Sigafoos, J., Lancioni, G., & Andrews, A. (2006). Isolating the evocative and abative effects of an establishing operation on challenging behavior. *Behavioral Interventions, 21*, 195–204.
- O'Reilly, M. F., Sigafoos, J., Edrisinha, C., Lancioni, G., Cannella, H., Choi, H., et al. (2006). A preliminary examination of the evocative effects of the establishing operation. *Journal of Applied Behavior Analysis, 39*, 239–242.
- Roantree, C. F., & Kennedy, C. H. (2006). A paradoxical effect of pre-session attention on stereotypy: Antecedent attention as an establishing, not an abolishing, operation. *Journal of Applied Behavior Analysis, 39*, 381–384.
- Schopler, E., Reichler, R. J., & Renner, B. R. (1988). *The childhood autism rating scale (CARS)*. Los Angeles: Western Psychological Services.
- Sparrow, S. S., Balla, D. A., & Cicchetti, D. V. (1984). *Vineland adaptive behavior scales: Interview edition*. Circle Pines, MN: American Guidance Service.
- Worsdell, A., Iwata, B., Conners, J., Kahng, S., & Thompson, R. (2000). Relative influences of establishing operations and reinforcement contingencies on self-injurious behavior. *Journal of Applied Behavior Analysis, 33*, 451–461.

Received September 14, 2006

Final acceptance February 28, 2007

Action Editor, Jennifer McComas