

*DISTINGUISHING BETWEEN EXTINCTION AND
PUNISHMENT EFFECTS OF RESPONSE BLOCKING:
A REPLICATION*

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Lerman and Iwata (1996) described a method for distinguishing between sensory extinction and punishment effects of response blocking on self-injurious behavior maintained independent of social contingencies. Results of their study suggested that blocking decreased the self-injurious hand mouthing of their participant via punishment. The current replication of these procedures with the self-injurious eye poking of a woman with developmental disabilities produced patterns of responding indicating that, for this participant, blocking functioned as an extinction procedure.

DESCRIPTORS: response blocking, sensory extinction, punishment

The effects of response blocking to treat self-injurious behavior (SIB) that persists independent of apparent social contingencies have typically been attributed to sensory extinction (e.g., Reid, Parsons, Phillips, & Green, 1993). Recently, investigators have suggested that the effects of blocking may, in some cases, be described as punishment (Lerman & Iwata, 1996).

A method for distinguishing between extinction and punishment effects of response blocking has been described by Lerman and Iwata (1996). If blocking functions as extinction, then blocking only a portion of responses should serve as intermittent reinforcement. For example, if some responses are blocked but others are permitted to occur, then SIB would be expected to maintain or increase with progressive increases in the schedule of blocking (i.e., as the schedule of reinforcement became thinner) until ratio

strain occurred. If, on the other hand, blocking functions as punishment, then blocking some but not all responses should result in an immediate suppression of SIB, with additional decreases as the schedule of blocking is progressively increased.

After demonstrating that the self-injurious hand mouthing of a man diagnosed with mental retardation persisted in the absence of social contingencies, Lerman and Iwata (1996) exposed hand mouthing to several schedules of blocking. Hand mouthing decreased to near-zero levels regardless of the schedule of blocking. These outcomes were interpreted as supporting a punishment account for their participant's hand mouthing. It is possible that the mechanisms associated with the effects of blocking vary, and that blocking functions as punishment for some individuals but as extinction for others. The current study replicated the procedures described by Lerman and Iwata to investigate the functional properties of blocking when applied to the self-injurious eye poking of a woman who had been diagnosed with profound developmental disabilities.

METHOD

Louise was a 41-year-old woman who resided in a large residential facility for persons

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with developmental disabilities. Her severe and chronic eye poking had resulted in blindness in both eyes and served as the basis for her referral to a day program for assessment and treatment of SIB. Sessions were 15 min in duration and were conducted one to three times daily, 5 days per week.

Data were collected using handheld computers (Apple Newton Message Pad Model 130®) onto which behavioral data-collection software had been installed (Behavior Observer System®). *Eye poking* was defined as contact between any digit of Louise's hand and her open eye or, during blocking, as contact between any digit of Louise's hand with the hand of the therapist (contingent on movement of Louise's hand toward the eye, the therapist placed his hand 4 to 6 cm in front of Louise's eye). These data were scored using an event recording method. Interobserver agreement data were independently collected during 43.2% of sessions and were converted into percentage agreement scores by dividing each session into 10-s intervals, calculating overall agreement within intervals, and averaging across the session. Mean interobserver agreement for eye poking and attempts was 92.0%, and session scores ranged from 84.0% to 100%.

A functional analysis conducted prior to this study revealed that Louise's eye poking was not affected by and persisted in the absence of social contingencies. Following this analysis, a baseline condition was conducted, during which no materials were present and Louise was permitted to engage in eye poking. Because the duration of eye pokes varied, the therapist gently interrupted each poke and guided Louise's hand to her side after 20 s (this was considered the equivalent of 20 s of access to reinforcement).

Following baseline, Louise was exposed to a continuous blocking procedure. Each time Louise attempted to place her finger in her eye, the therapist placed his hand between

Louise's finger and her eye. Although the therapist made every effort to block each attempt, Louise was occasionally able to place her finger in her eye. If this happened, the therapist immediately, and as gently as possible, guided Louise's finger down.

After a return to baseline, Louise was exposed to a series of conditions in which half, two thirds, and four fifths of all attempts to eye poke were blocked (response blocking .5, .67, and .8, respectively). As in baseline, the duration of eye pokes that did occur was limited to 20 s. Following a third baseline condition, continuous blocking was reinstated through the remainder of the study.

RESULTS AND DISCUSSION

Figure 1 shows that Louise's eye poking was maintained at moderate levels in baseline conditions, with mean responses per minute of 1.64, 1.58, and 1.15 during the three baseline conditions. Continuous blocking resulted in gradual decreases in eye-poke attempts to near-zero rates. Mean responses per minute during the last five continuous blocking sessions were 0.398 and 0.144 for the two continuous blocking conditions. Intermittent blocking produced increases in eye-poke attempts during blocking .5 and .67, with condition means of 1.9 and 2.33 responses per minute, respectively. Responding initially maintained at high levels during the blocking .8 condition (mean rate during the first five sessions was 2.33), but decreased to near zero over 12 sessions.

Several aspects of the results suggest that, for Louise, response blocking functioned as an extinction procedure. First, eye poking decreased gradually, rather than rapidly, when continuous blocking was implemented. Second, rates of eye-poke attempts increased slightly during blocking .5 and .67 conditions, as is typical of operant behavior under intermittent reinforcement schedules.

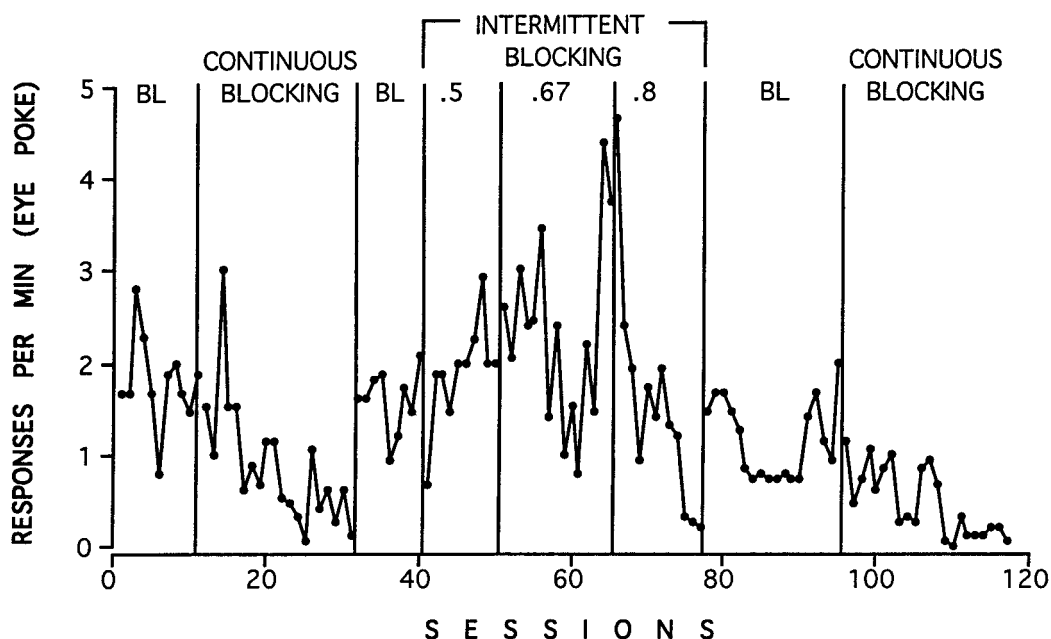


Figure 1. Eye-poke responses per minute during baseline and blocking sessions.

Third, there was some evidence of an initial extinction burst, followed by a gradual decrease in responding during both the initial continuous blocking condition and the blocking .8 condition. Fourth, responding became quite variable during the blocking .67 and blocking .8 conditions, showing occasional periods of rapid responding (i.e., spikes) prior to the eventual decrease observed in the blocking .8 condition; these patterns are consistent with the phenomenon of ratio strain, in which increased ratio requirements cause a breakdown in schedule control (Ferster & Skinner, 1957). Thus, Louise's outcomes suggest that intermittent blocking employed in the current study functioned as fixed-ratio (FR) 2, FR 3, and FR 5 schedules of reinforcement, rather than punishment.

These outcomes stand in contrast with those produced in Lerman and Iwata's study (1996), which strongly suggested that blocking served as punishment for their partici-

pant's hand mouthing. This illustrates that, whereas blocking may reduce one participant's behavior via punishment, it may extinguish another participant's behavior. This also demonstrates the utility of the Lerman and Iwata procedure for discriminating the behavioral processes that underlie the effects of blocking.

Knowledge of the functional properties of blocking can be important for treatment decisions. For example, if blocking serves as extinction, then it would be contraindicated for cases in which it could not be implemented with near-perfect integrity. In such cases, failures to block each attempted response could exacerbate, rather than ameliorate, the problem. Future replications of these procedures might reveal the relative frequencies with which extinction or punishment occurs during blocking, the variables that determine such behavioral effects, and the side effects associated with these processes during treatment.

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