

## EFFECTS OF CONTINGENT SHOCK AND VERBAL COMMAND ON BODY ROCKING OF RETARDATES\*

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Stereotyped mannerisms, such as body rocking, hand waving, and head rolling, are observed commonly among institutionalized retardates. Berkson and Davenport<sup>(2)</sup> reported that up to two-thirds of the severely retarded population may engage in such behaviors. The most prevalent form of this stereotypy is body rocking. Kaufman and Levitt<sup>(9)</sup> observed body rocking in 69% of a sample of 83 moderately to profoundly retarded individuals.

Of the various forms of stereotyped behaviors observed in severe retardates, body rocking also has been the most thoroughly studied. This is due in part to the high frequency of body rocking among this population and partly to the high reliability that can be achieved in the measurement of body rocking. Frustration of goal-directed behavior, presentation of intense sounds, physical restraint, and the presence of other stereotypers are known to produce increases in rates of repetitive rocking<sup>(1, 4, 5, 6)</sup>. On the other hand, visual stimulation and the presence of objects to manipulate result in decreased stereotypy<sup>(3, 5)</sup>.

It should be emphasized that in none of the aforementioned studies was stimulation made directly contingent upon deceleration or acceleration of rocking. There is, however, some evidence that rocking can be brought under control of its consequences. Mulhern and Baumeister<sup>(10)</sup> were able to reduce the rate of body-rocking in two patients by withholding candy reinforcement until the *S* remained still for a prescribed period. Hollis<sup>(8)</sup>, in a similar study, differentially reinforced low rates of body rocking in at least one *S*. Nevertheless, in none of these cases was body rocking reduced to a near-zero rate. In spite of a marked reduction in stereotypy, all of these *Ss* still were emitting stereotyped behaviors with high frequency during the experimental treatment. Perhaps more powerful and/or aversive stimulus consequences would yield greater suppression effects.

### EXPERIMENT I

The first experiment tested the efficacy of contingent electric shock on reduction of stereotyped rocking of severe mental retardates. Research with this type of subject has shown that a variety of behaviors, such as tantrums, self-mutilation, climbing, rumination, vomiting, and soiling can be affected by aversive consequences<sup>(7)</sup>. However, few studies of mental retardates that involved shock have been carried out under controlled laboratory conditions<sup>(13)</sup>.

### METHOD

*Subjects.* The *Ss* were three institutionalized males who displayed frequent rocking behavior on the ward. In fact, rocking is about all they were observed to do. They were neither testable nor verbal. Examination of institutional records indicated that no diagnosis had been entered for two *Ss*; for one *S* the diagnosis was "encephalopathy due to uncertain causes." None was reported to have convulsions. Their ages were 19, 32, and 33.

*Test Environment and Apparatus.* An 8' x 8' room served as the test environment. The room was empty except for a chair. A one-way vision screen was mounted in one wall. A moderate level of illumination was maintained by the light from a window and an overhead incandescent lamp. Although no effort was made to control for extraneous noises, the room was located in an area of the cottage that was fairly quiet relative to the ward.

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The major item of equipment was a shock apparatus (Master Shocker, A-615A, Lafayette Instrument Company). A Boy Scout belt with two attached copper plates, separated from each other by 2", was used to deliver the shock. Initiation of a shock was controlled by a switch the *E* held while he observed the *S*.

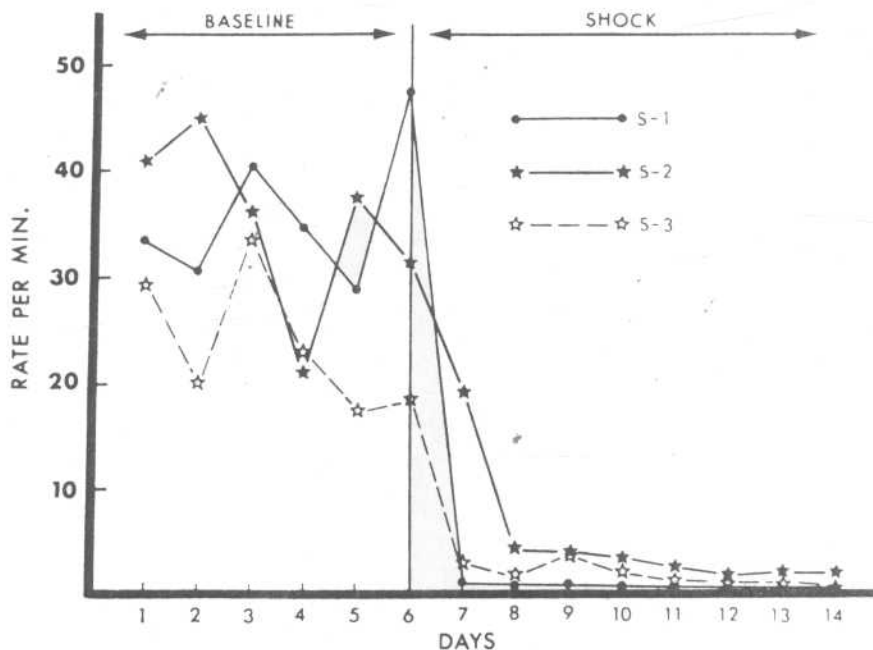
*Procedure.* Each *S* participated in the study for 14 days. The first 6 days provided baseline data, while on the last 8 days contingent shock was delivered. During the baseline period the *S* was seated in the chair daily for 25 minutes. He was loosely strapped in the chair so that body movements could occur but so that he could not leave it. The belt also was placed firmly around the *S* with the copper plates on the abdomen. The experimenter, who was observing through the one-way window, counted the body rocks that occurred during each 25-minute session.<sup>1</sup>

During the shock sessions, each *S* again was strapped loosely in the chair for daily 25-minute sessions. The Boy Scout belt was placed on the *S* as before. The copper plates in the belt were wired to the Master Shocker. The experimenter, by closing a switch, could initiate a shock. Shock was made contingent on the occurrence of body-rocking. Each full body-rock was immediately followed by .5 sec. of a constant current shock of 1.75 ma, RMS. This shock level was first tested by the *E*s and found to be aversive but not harmful. The *E*, who was observing through the one-way window, both initiated the shock and counted body rocks.

#### RESULTS AND DISCUSSION

All three *S*s displayed fairly high rates of rocking during the baseline sessions and averaged 22.7, 35.3, and 35.9 rocks per minute. Their means from the sessions with contingent shock were 1.6, 5.1, and .1, respectively. Fig. 1 presents a graph of each *S*'s rates for baseline and treatment conditions. Clearly, contingent shock inhibited body rocking behaviors in these three patients.

FIG. 1. BODY-ROCKING RATES FOR INDIVIDUAL *S*s OVER BASELINE (DAYS 1-6) AND CONTINGENT SHOCK (DAYS 7-14).



<sup>1</sup>Interobserver reliabilities were evaluated in pilot work with 15 *S*s and three observers. Reliability coefficients were uniformly high and ranged from .94 to .97.

There can be no doubt that contingent shock stimulation is a highly effective means to inhibit body rocking. However, three questions immediately are raised by these results: (a) Would noncontingent shock produce the same effect? (b) Which, if any, secondary cues would generalize to a new context? (c) How durable is this effect?

With regard to the first question, it is difficult to imagine when a noncontingent shock could have been administered to these particular *Ss*. Inasmuch as their behavior during the baseline period consisted almost entirely of constant rocking, the choice of when to deliver the shock was somewhat arbitrary. One could have administered punishment during the forward motion, at the completion of the forward motion, during the backward motion, or following the entire sequence. It is our conclusion, therefore, that all shocks given to these particular *Ss* would be "contingent."

The second question, concerning generalization of suppression effects, is a particularly important one for therapeutic considerations. It is clear that passive avoidance conditioning had occurred in the experimental context. After 2 days of receiving shocks for body rocking, our *Ss* emitted very few responses. During the last 4 days, no shocks were administered. Although the study was not specifically designed to delve into this question, it does appear that control over body-rocking was limited to the immediate experimental environment. During the last 4 days of the experiment, each *S*, subsequent to his session in the chamber, also was observed for a 25-minute period in a waiting room adjacent to the experimental chamber. Under the assumption that it had acquired secondary aversive properties, the belt was left attached to the *S*. Body rocking under these conditions was equivalent to that observed during the baseline sessions (about 30 responses per minute, on the average). The finding that shock is situation specific appears to be consistent with the general conclusion that emerges from the punishment literature<sup>(12)</sup>.

Finally, a follow-up was attempted after 10 months. At this point, only one *S* (#1) was still available. His base response rate, in the adjoining waiting room, was 35 rocks per minute over 30-minute periods on each of two successive days. When placed back in the experimental chamber with the belt about his midsection, he did not rock at all. The complete suppression of his response rate evident in Fig. 1 had persisted over an intervening 10-month period. The suppressive effects of shock observed here may not have great generality, but they certainly appear to be durable.

Inevitably, the question arises as to the desirability of using electric shock in an experimental context to inhibit a behavior as seemingly harmless as body rocking. In this regard, three facts should be stressed. First, excessive stereotypy is *not* harmless. To the extent that any stereotyped act excessively dominates the behavioral output of an individual, he is not likely to engage in other more potentially adaptive behaviors. Indeed, it is sometimes the case that high frequency of stereotypy is a reason given for exclusion of patients in systematic programming activities. Secondly, our own research in this area has shown that some *Ss* who demonstrate marked stereotypy are highly resistant to less aversive control procedures. Finally, although the application of electric shock is becoming a more accepted therapeutic procedure, there have been few studies reported in the mental deficiency literature in which shock has been tested in controlled and replicable situations.

## EXPERIMENT II

The *Ss* employed in the previous study neither verbalized nor were they responsive to verbal instructions. However, other body-rocking retardates often do respond to some verbal commands. The purpose of the second experiment was to determine whether a contingent verbal command ("Stop rocking!") shouted at *Ss* who had some verbal capacity would inhibit their body rocking. This general procedure has been attempted before, but in a less formal experimental context. Risley<sup>(11)</sup> has reported the case of an autistic girl in whom body rocking was terminated by shaking her and shouting at her contingent upon rocking episodes.

## METHOD

*Subjects.* Six male institutionalized retardates participated in this experiment. All had displayed rocking behavior on the ward. IQs ranged from 20 to 30, ages from 20 to 30 years. All Ss were ambulatory and without apparent gross sensory impairments. They could respond to simple verbal commands such as "Come here." The observation room was the same as that described above in reference to Experiment I.

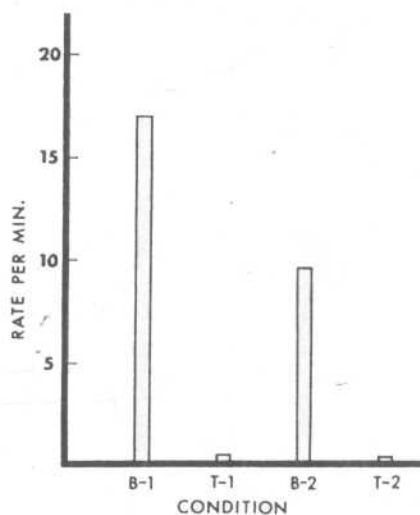
*Procedure.* Each S was observed for 12 daily sessions of 15 minutes duration. During each session, the experimenter, who observed through the one-way mirror, counted the body rocks that occurred during the 15-minute intervals.

Measurements of body rocking were obtained under two conditions: (a) during baseline, and (b) after the verbal command to cease rocking. Baseline data were obtained from the first three sessions. During the next three days (4-6), each time the S rocked, the experimenter shouted "Stop rocking!" from behind the one-way window. The entire procedure (baseline and treatment) was repeated over the following six sessions (days 7-12). Thus, the design allowed for replication of treatment effects both within-Ss as well as between-Ss.

## RESULTS AND DISCUSSION

The results of Experiment II are displayed in Fig. 2. The mean number of body rocks was 17.0 and 9.7 for the first and second baseline conditions, respectively. The mean number of responses followed by a contingent verbal command to stop were .4 and .2 for the first and second treatment conditions, respectively. This effect was statistically significant ( $p < .025$ ), and was demonstrated by all 6 Ss.

FIG. 2. AVERAGE BODY-ROCKING RATES UNDER BASELINE (B<sub>1</sub> AND B<sub>2</sub>) AND TREATMENT (T<sub>1</sub> AND T<sub>2</sub>) CONDITIONS. "TREATMENTS" CONSISTED OF A CONTINGENT VERBAL COMMAND TO "STOP ROCKING!"



As in the case of shock, a verbal command to cease rocking resulted in a near-zero rate. This is not to say, however, that the Ss were responding specifically to a command to "Stop rocking!" Perhaps any shout would have produced the same effect. Nevertheless the procedure employed here did inhibit body rocking and, therefore, may be considered a punishing event. Body rocking appears to be a behavior that can be brought under rapid control by aversive consequences. Both electric shock and verbal command may have implications for therapeutic programming with chronic stereotypers.

## SUMMARY

Two studies were conducted to determine the effects of contingent electric shock and verbal command ("Stop rocking") on stereotypy body rocking of severely retarded Ss. Ss were observed in a controlled environment under baseline and treatment conditions. A few contingent shocks brought high rates of body rocking in all Ss to near-zero levels. Although this effect appears to persist over a long period of time, it also is evidently highly situation-specific. The verbal command also produced a rapid cessation of rocking.

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