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RESPONSE SUPPRESSION AS A FUNCTION OF A VACATION FROM PUNISHMENT[1]

Department of Psychology
University of Maryland

Prepared by:

David Orme-Johnson

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Abstract

When Ss are removed from a punishing situation for some time and then reintroduced into the same situation, the punishment effect is often increased. The present experiment showed that after a two day vacation the rate of responding of pigeons during punishment was much lower than it was before the vacation. However, with successive vacations, this effect on punishment diminished.

In their recent review of the punishment literature, Azrin and Holz (1966) discussed the effects of a vacation or time away from punishment on the effectiveness of punishment (p. 398). In these experiments, the parameters of the experiment are kept constant and the response rates during punishment before and after a vacation are compared. A vacation can be defined as either complete removal of the S from the experimental setting or it can be the removal of only the punishing stimulus while S remains in the experimental setting. Using either procedure, the punished response rate after a vacation is either the same or lower than the pre-vacation response rate (Masserman, 1946; Azrin, 1959 a; Azrin, 1960, Brethower and Reynolds, 1962). Why would time away from punishment result in a greater punishment effect? One step towards answering this question would be to see how stable the effects of vacation are for repeated measurements using the same vacation interval.

METHOD

Subjects:

The subjects were four white Carneaux pigeons. They were approximately seven years old and were maintained at 78% $\pm$ 5 grams of their free feeding weight throughout the investigation. The subjects experimental history consisted of a conditioned suppression paradigm superimposed on the same baselines used in the present investigation.

Apparatus:

The apparatus was a 33 x 33 x 33 cm. chamber which was enclosed in a ventilated, sound-attenuated cubicle. Two translucent Gerbrands' response keys mounted 23 cm. from the floor and 9 cm. apart were operated by a force of 20 grams. The right key was illuminated by a blue light and the left key by a white light. A relay click provided response feedback. Ambient illumination was provided by two 7 watt white lights mounted on the rear ceiling of the chamber. The reinforcer was a 3 sec. exposure to a grain mixture of 60% milo, 50% vetch and 10% hemp.

The punisher shock was 50 msec. a.c. delivered through an 80 K series resistor. The shock was delivered to the pigeons using the techniques described by Azrin (1959 b). The resistance for individual subjects varied less than 5% throughout the experiment and was 1000 ohms for B 2077 and 1400 ohms for B 47.

All programming equipment was located outside the experimental room.

Procedure:

Pretraining.

Ss were given one 60 min. session a day 7 days per week. Each hourly session consisted of six 10 min. cycles. During a cycle, either the right, blue key or the left, white key was illuminated. The schedule of positive reinforcement on both keys was variable interval 1' in which the inter-reinforcement time varied randomly from 2 to 120 sec. and averaged 60 sec. (Ferster and Skinner, 1957). On the left key, every response was punished and with a 50 msec. response contingent shock. The shock intensity was individually adjusted for the two subjects. The shock intensity was initially .2 milliamperes and was increased in .2 ma increments. If the response rate during a 10 min. cycle exceeded 90% of the non-punished rate, the intensity was increased in steps of .2 ma until a stable suppression of about 85% of the non-punished rate was reached. The final shock intensities were 2 ma for B 2077 and 2.4 ma for B 47.

Technically, then , Ss were on a multiple schedule (Ferster and Skinner, 1957) in which different stimuli (key colors) were associated with the punished and non-punished conditions and with only one condition in effect at any one time. In addition, between cycles of punishment and non-punishment there was a 30 sec. period during which the key lights and house lights were all inoperative.

Ss previous experimental history was approximately 100 hr. sessions on this multiple schedule during which they were exposed to a conditioned suppression paradigm. After the last suppression trial, Ss continued to be run 7 days a week for three additional weeks on the multiple schedule.

Vacation.

Ss were then shifted to cycles of 5 days of working and 2 days of vacation. During a vacation Ss remained in their home cages and were given food sufficient to maintain their 78% wt. Water was available ad lib. in the home cage. Ss were run on cycles of 5 days working and 2 days vacation for 7 weeks.

RESULTS

Figure 1 shows cumulative records for before and after the second vacation. A P below a record indicates a punishment cycle

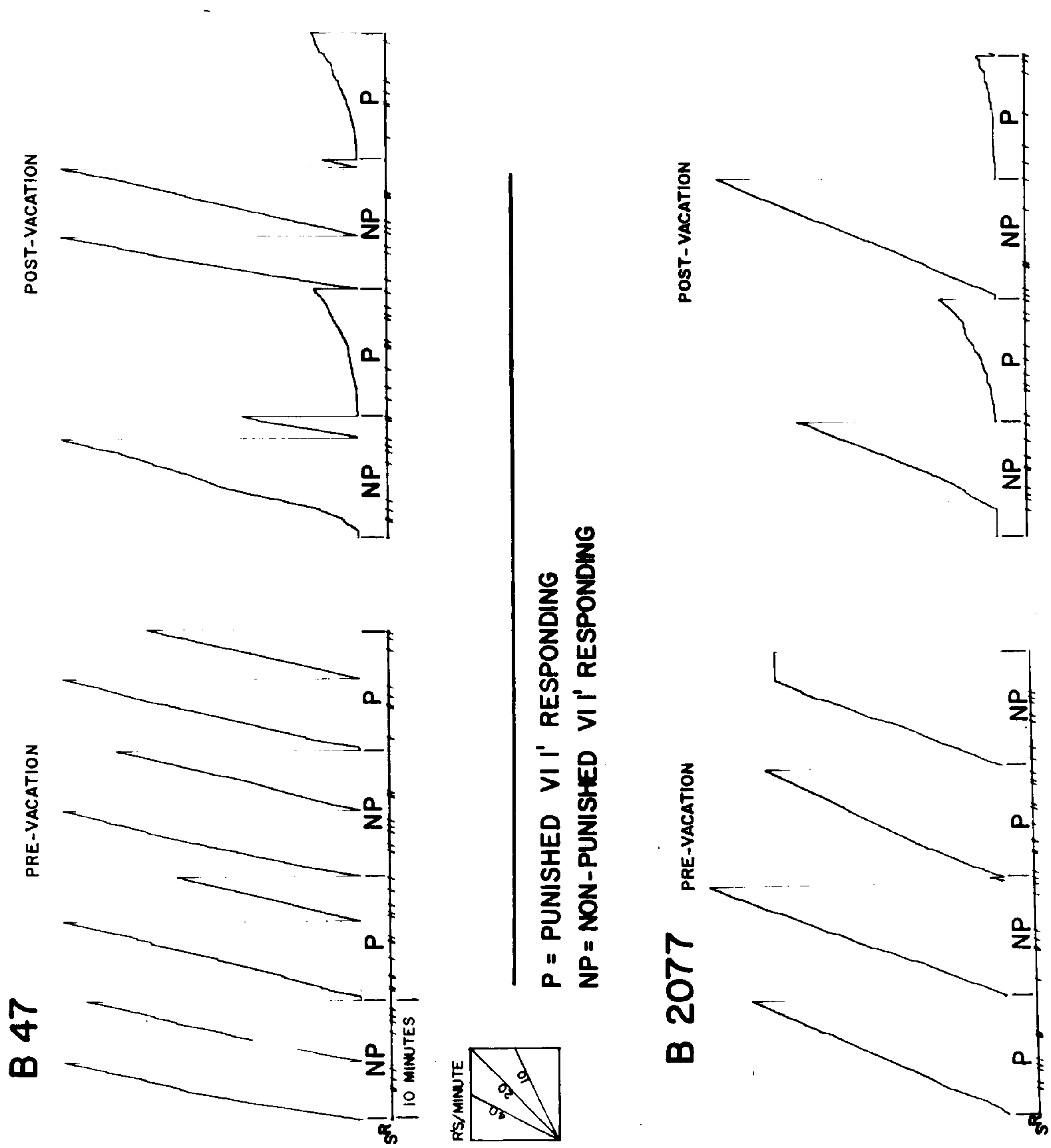

Fig. 1. Cumulative records for before and after a vacation.

and a NP indicates a non-punished cycle. The day before the vacation the punished and non-punished response rates were about equal. After the vacation, there was a large decrement in the punished response rate, but little change in the non-punished rate.

However, with successive vacations, a vacation tended to have less and less of an effect on punishment responding. This is shown in Fig. 2. In this figure, the response rate before a vacation divided by the response rate after a vacation is plotted on the ordinate against successive vacations plotted on the abscissa. A ratio of 1.0 indicates no change between before and after a vacation while a small decimal indicates a large decrement after a vacation relative to before the vacation.

For both Ss, the 2 day vacation initially produced a large decrement in the punished response rate and with successive vacations this decrement decreased until by the 7th replication the vacation had little effect on punished responding.

By comparison, the vacation had little effect on the non-punished component of the multiple schedule.

DISCUSSION

The experiment demonstrates that a 2 day vacation from punishment differentially effects punished and non-punished VI 1' responding on a multiple schedule. The non-punished component was relatively uneffected by the vacation while the punished component showed a response decrement after the vacation. Also, the magnitude of the decrement decreased with successive vacations. These

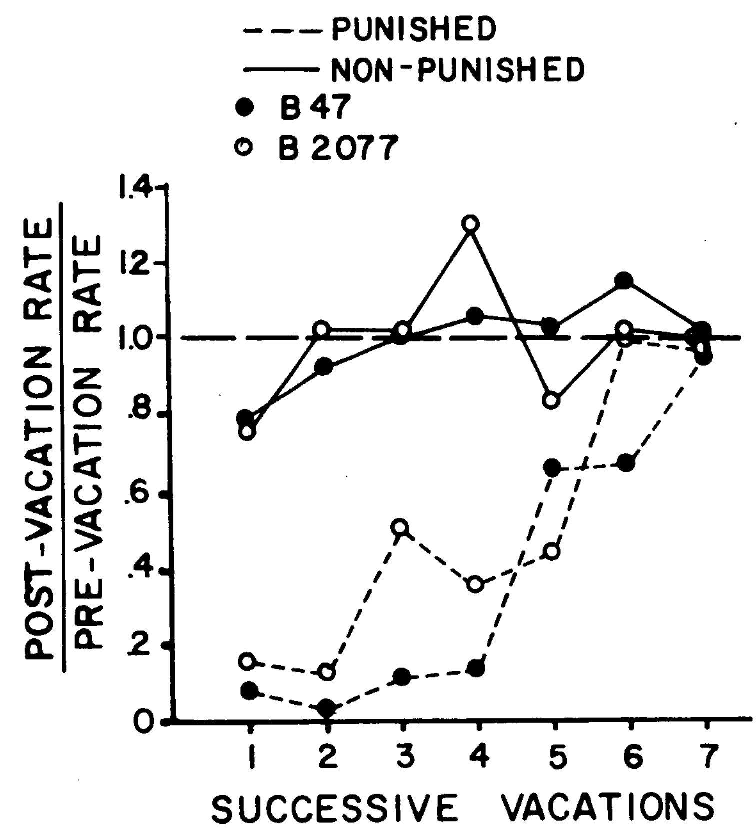

Fig. 2. Response suppression as a function of successive vacations.

resulta indicate that the effects of a vacation on punishment depend upon the organisms previous vacation history.

Experiments in which the independent variable is time away from some constant experimental conditions are often considered in the context of memory and forgetting. However, in the present experiment the behaviors were well established thru months of exposure to the contingencies so it is unlikely that anything was forgotten. Indeed, the vacation had little effect on VI responding alone. It seems more plausible to consider the vacation as increasing the effectiveness of the punishing stimulus rather than as forgetting of some kind.

But why should time away from punishment increase the effectiveness of punishment? Operationally, the relatively lower punished response rate after a vacation defines the punishing stimulus as more aversive after a vacation.

One possible explanation of why a vacation should increase the aversiveness of a punisher is that a behavioral contrast developes after the S is exposed to free feeding during a vacation.

The procedure and results of the present experiment are similar in many respects to those of behavioral contrast experiments. Behavioral contrast is defined when the response rate during one component of a multiple schedule is changed as a function of changing the response rate in a second component of the multiple.(Reynolds, 1961). The rate change in the second component is often achieved by changing the schedule of reinforcement during that component. For example, negative contrast would be defined when the response rate dropped in component A as a function of increasing the rate in component B via increasing the frequency of reinforcement in component B.

In the present experiment, the daily cycles of 23 hr. in the home cage and 1 hr. in the experimental chamber might be considered as a multiple schedule. Under the initial arrangement of working 7 days a week there was no food given in the home cage. However, during the vacation Ss were fed in the home cage for 2 days and the rate drop in punished responding after the vacation may have been a negative contrast effect to the free feeding in the home cage.

There is some evidence (Terrace, 1967) that contrast effects diminish with repeated exposure to the contrast-producing conditions. The present finding that the effects of a vacation on punishment diminish with repeated exposure to vacations is consistent with the view that the vacation effect is a contrast effect.

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