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A METHOD FOR RAPID CONDITIONING OF STABLE AVOIDANCE BAR PRESSING BEHAVIOR[1]

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Certain difficulties are frequently found during attempts to condition rats to an avoidance bar press to a flashing light. In this study a flashing light (5/sec) was presented for 5 sec and followed by grid shock from a Grason-Stadler source and scrambler Model E1064GS. A bar press during the flashing light would terminate the trial (avoidance), or after 5 sec, a bar press would terminate the light and grid shock (escape). Trials were programmed randomly with an average inter-trial interval of 40 sec. Contrary to expectations, the five rats in the experiment developed a "freezing" response to the light although they efficiently made escape bar presses at the onset of grid shock. Only one rat produced any consistent avoidance behavior, (up to 75% avoidance) but it lost the response after a few days of testing. Testing continued for hundreds of trials with alterations of shock intensities and CS durations. Other stratagems included presenting a series of paired light and grid shocks before the series of avoidance trials, rewarding an avoidance response with a long intertrial interval, *etc.*, but none led to consistent avoidance bar pressing. When avoidance behavior is a variable dependent upon other manipulations involving prior training, or delicate surgical interventions, it is expensive and demoralizing to eliminate subjects for failing to acquire avoidance behavior in the final experimental stage. Similar difficulties were encountered by Meyer, Cho and Wesemann (1960) who concluded that a bar-pressing response to a CS to avoid grid shock wasn't in the nature of things and that other responses had better be sought. We ultimately decided that the subjects had to be *forced* to make a response other than the incompatible response. Therefore, short bursts of grid shock were applied as soon as the subjects assumed the "freezing" crouch. Within 50-60 trials the rats that had made hundreds of "freezing" responses to the flashing light began and continued to make avoidance responses. During subsequent days, the few regressions to "freezing" behavior were quickly eliminated by the judicious application of grid shock.

For the other rats, the CS duration was increased to 30 sec to allow more time to decide if "freezing" had occurred. The shock intensity was usually kept at around 1.0 ma. The shocks were given only if the rats assumed the "freezing" crouch and were stopped as soon as the animal moved, even as little as moving its head from side to side. The point was to eliminate "freezing", which is incompatible with bar pressing, and allow the avoidance responses to occur. Avoidance began to occur after 10 or 12 trials and increased in frequency so that after 50-60 trials the special grid shocks could be omitted, as the animals were avoiding shock 70-80% of the time. Subsequently, when there were reversions to "freezing", a few more short shocks were given.

Elimination of bar holding responses. During these training methods, bar holding was a consistent feature of the rats' behavior even though only a bar press and release yielded an avoidance or escape. Prodding and pushing the rat off the bar with a stick was not successful; the animal would return to the bar when the stick was withdrawn. However, the use of momentary grid shocks eliminated bar holding quite well. The only caution observed was that shocks to break bar holding were not applied until at least 7-10 sec had elapsed after an avoidance or escape response. When avoidance behavior occurred on 50% of trials the bar-holding interval was reduced to 5, then to 3 sec. In our most recent training procedures, after avoidance responses began appearing regularly, grid shock began after 3 sec

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of bar-holding—the shock continuing until the bar was released. Rats usually released the bar within 1 sec of shock. Within ½ hr of testing the rats did not receive more than 4 or 5 shocks while holding the bar.

Since the initial observations with the original five animals, many more animals have been efficiently trained by this method and consistent avoidance behavior obtained in every case.

REFERENCES

Meyer, D. R., Cho, C., and Wesemann, A. S. On problems of conditioning discriminated lever-press avoidance response. *Psych. Rev.*, 1960, **67**, 4, 224-228.