AN AVOIDANCE TREADWHEEL

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The endless belt, motor-driven treadmill is commonly used to study the effects of drugs on the forced locomotor activity of laboratory animals. The treadmill is a relatively insensi-

tive measuring device since it must be turned off whenever a drug begins to have significant effects on the animal's locomotor performance. In addition, the very stable running behavior

Fig. 1. Avoidance Treadwheel.

generated by the moving belt may tend to override any drug effects that might otherwise occur in an apparatus that allowed for more variability in running rate.

In an effort to overcome these shortcomings of the treadmill, we have designed the "Avoidance Treadwheel" shown in Fig. 1. The 6 ft 8 in by 18 in wheel was constructed of steel angle iron, chicken wire, and masonite lined with ribbed rubber mat. The wheel can rotate freely in either direction. The dog shown in the figure was lightly restrained by a leather harness containing a pair of EKG electrodes through which electric shock could be delivered via a brush and slip ring arrangement.

A Foringer Shock Power Supply (Catalogue No. 1154, Foringer and Company, Rockville, Maryland, 60-cycle AC sine wave, voltage adjusted from 600 to 800, depending on the subject, 80,000 ohm resistor in series with the subject) served quite adequately as a shock source. Each rotation of the wheel briefly opened a microswitch and constituted the animal's response.

Four mongrel dogs were trained to avoid electric shock by rotating the wheel according to a Sidman avoidance procedure (Sidman, 1953). The R-S and S-S values were initially set at 20 sec and 2 sec, respectively. Avoidance sessions varied in length from 10 to 15 min with from 20 to 30 min between sessions. Each animal received from 4 to 10 sessions daily. The R-S interval was reduced in from 2- to 5-sec steps whenever the animal completed a session without receiving a shock. A final R-S value of 10 sec was reached within 4 to 20 ses-

Fig. 2. Wheel turning response rates during S^D and S^A.

sions. A pair of flickering 40 w bulbs and a buzzer were on (S^D) during each avoidance session and off (S^A) at all other times. In Fig. 2, the wheel rotation rates for the 21st to the 30th S^D and S^A sessions are presented for a single animal. Ten 10-min S^D sessions alternated with the same number of 10-min S^A sessions. The R-S and S-S values were 10 and 2 sec, respectively. These data are representative. The S^D response rate is remarkably constant from session to session and the discriminative control of the light and buzzer is excellent.

Wheel turning avoidance behavior in the dog is apparently easily learned, quite stable, and quickly brought under at least gross stimulus control.

REFERENCES

- Sidman, M. Avoidance conditioning with brief shock and no exteroceptive warning signal. *Science*, 1953, 118, 157-158.