JOURNAL OF THE EXPERIMENTAL ANALYSIS OF BEHAVIOR 1971, 15, 197-198 NUMBER 2 (MARCH)

TECHNICAL NOTE

AUTOMATIC MAGAZINE AND BAR-PRESS TRAINING IN THE RAT

Recently, a number of articles have appeared that demonstrated automated response training. Brown and Jenkins (1968) introduced a procedure for "auto-shaping" of a pigeon's key peck. Using similar procedures Sidman and Fletcher (1968) demonstrated auto-shaping of a panel press with monkeys and Gardner (1969) obtain auto-shaped key pecking with Bobwhite quail. Williams and Williams (1969), in an interesting departure from the auto-shaping technique, demonstrated auto-shaping of key pecking in pigeons even when pecking prevented the occurrence of scheduled grain presentation. Finally, Rachlin (1969) demonstrated auto-shaping of key pecking with pigeons using negative reinforcement.

The present research was designed to extend the above research by demonstrating a new, automated magazine-approach training technique as well as an automated bar-pressing procedure with rats.

The subjects were five 180-day-old female Long-Evans rats. All of the rats were experimentally naive at the start of the experiment. For seven days before experimental training the rats were given 30 min per day of access to Purina rat chow in their home cages at approximately the time they would run in the experiment. Water was freely available in the home cages. Reinforcers were 45-mg Noyes pellets.

The apparatus was a modified Scientific Prototype rat chamber Model A 105. A photocell and a light source were mounted on opposite sides of the pellet tray. The standard bar operandum was taken out and a sanded (previously clear) Plexiglas bar of approximately the same size was inserted in its place. A 28-v light was placed outside of the chamber and directly above the operandum. Turning on the 28-v light illuminated the Plexiglas bar. All scheduling and recording was accomplished by relay circuitry, counters, and a six-pen event recorder.

The session was started with a fixed 40-sec intertrial interval (ITI). At the termination of the ITI, the Plexiglas bar was illuminated for 30 sec (S^D). Upon termination of the S^D, the magazine was operated and the photocell light in the pellet tray was activated. The photocell light remained on until being interrupted by the subject's head or paw while retrieving a pellet. Upon the subject's interruption of the photocell beam, the light was terminated and the next ITI was started. However, if the subject responded on the bar during the S^D, the bar light was turned off, the magazine was immediately operated, and the photocell light was flashed for 90 msec.[1] The reason the photocell light was flashed if the subject pressed the bar was because it (light) had previously been associated with magazine approach and reinforcement.

Latency for magazine approach behavior was recorded from photocell light onset to its interruption by the subject. The criterion for learning was set at 10 consecutive bar-press responses. Each subject was given 50 reinforced bar-press responses to assess the stability of the procedure.

The latency data for magazine-approach behavior indicated that magazine approach was acquired fairly rapidly. Latency data showed that Subject 1 was making approach responses of 1 sec by Trial 3; Subject 2, 1 sec by Trial 4; Subject 3, 1 sec by Trial 11; Subject 4, 1 sec by Trial 3; Subject 5, 1 sec by Trial 7. Data for bar pressing indicated that Subject 1 met the 10 consecutive response criterion for learning on Trial 43, Subject 2 on Trial 29, Subject 3 on Trial 300, Subject 4 on Trial 15, and Subject 5 on Trial 22. Observation of the 50 reinforced bar-press responses to assess the stability of the procedure confirmed that after the 10 consecutive trials of reinforced responses were met, the rats continued to respond on each trial afterwards.

To test response transfer to a metal bar the subjects were run in a BRS-Foringer rat chamber 20 days later. All contingencies described earlier remained in effect except that the cue light in a standard BRS-Foringer chamber was mounted inside the chamber above the response bar. Results indicated that all subjects responded during the S^D from the first trial onward.

Thus, the results demonstrate that automatic magazine and bar pressing can be obtained, and in one short session. Further, these results indicate that the procedure provides a feasible and time-saving alternative to traditional monitoring of behavior by the experimenter for manual magazine training and bar press shaping.

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[1]The authors currently are leaving the photocell light on after a bar response until interrupted as on the non-bar response trials.

REFERENCES

Brown, P. L. and Jenkins, H. M. Auto-shaping of the pigeon's key peck. *Journal of the Experimental Analysis of Behavior,* 1968, **11,** 1-8.

Gardner, W. M. Auto-shaping in bobwhite quail. *Journal of the Experimental Analysis of Behavior,* 1969, **12,** 279-281.

Rachlin, H. Auto-shaping of key pecking in pigeons with negative reinforcement. *Journal of the Experimental Analysis of Behavior,* 1969, **12,** 521-531.

Sidman, M. and Fletcher, F. G. A demonstration of auto-shaping with monkeys. *Journal of the Experimental Analysis of Behavior,* 1968, **11,** 307-309.

William, D. R. and Williams, H. Auto-maintenance in the pigeon: sustained pecking despite contingent non-reinforcement. *Journal of the Experimental Analysis of Behavior,* 1969, **12,** 511-520.