TECHNICAL NOTE

*A PROCEDURE FOR AUTOSHAPING THE PIGEON'S
KEY PECK TO AN AUDITORY STIMULUS¹*

Pigeons rapidly acquire a key-pecking response when 8-sec illuminations of a response key precede each presentation of grain (Brown and Jenkins, 1968). Bilbrey and Winokur (1973) and Winokur and Boe (1975) have reported that such autoshaped responding does not occur when grain presentation is preceded by a tone, either presented from a speaker separate from the response key or from a speaker behind the key. The present research was suggested by evidence that generalization may play a role in autoshaping (Steinhauer, Davol, and Lee, 1976). Initial pecks at the lighted key in the standard autoshaping procedure may occur as generalized pecks at the lighted grain hopper. Similarly, presentation of a tone from the source of grain delivery (as the hopper light is presented in standard autoshaping) may facilitate acquisition of pecking toward a similar tone originating behind the response key.

To investigate this possibility, a Lehigh Valley Electronics three-key operant conditioning chamber was modified as follows. Ten 1.5-mm diameter holes were drilled in the center key. A speaker, 37.5 mm in diameter, was mounted in a sound-attenuating enclosure and secured to the back of the intelligence panel behind the center key. A 25-mm hole was drilled in the side of the speaker enclosure that adjoined the intelligence panel. With this modification, a tone could be propagated into the chamber through the center key. An identical speaker was mounted inside the grain hopper, and the standard grain-hopper light was removed. The control and recording equipment were in an adjoining room.

Four experimentally naive pigeons were reduced to 80% of their free-feeding weights and then given three daily sessions of magazine training. A magazine-training trial consisted of elevating the grain hopper and presenting a 1000-Hz, 80-dB tone from the hopper speaker. The grain hopper remained elevated and the tone on until the experimenter had observed the pigeon eating from the hopper for 4-sec. Thirty such trials occurred on a VT 60-sec schedule during each of the three magazine training sessions. On the next day, each subject was given 100 autoshaping trials on a VT 60-sec schedule. Each trial began with presentation of an 8-sec, 1000-Hz, 80-dB tone from behind the unlighted center key, followed by 4-sec grain access ac-

companied by the same tone from the grain-hopper speaker. During the autoshaping session, pecks on the key terminated the key tone and were followed by grain-hopper elevation coincident with the hopper tone. At all times during magazine training and autoshaping, the response key and the grain hopper were unlighted. The houselight was on continuously.

During the autoshaping session, the first key peck occurred on trials 2, 8, 26, and 11 for the four birds respectively. The number of trials on which a key peck occurred, following the trial of the first peck, was 91, 71, 68, and 87; the total number of responses was 136, 355, 184, and 271. While all four pigeons were observed to eat from the grain hopper on most trials, the birds occasionally were observed to continue pecking the key after the key tone went off and the grain hopper was raised.

The present results stand in sharp contrast to previous reports of failure to obtain autoshaped key pecking to an auditory stimulus. Presentation of the hopper tone concomitant with grain presentation appears important, since previous studies without this procedure did not obtain autoshaping. Extended magazine training with the hopper tone may also be needed. Pilot work in this laboratory indicated that birds given 10 magazine-training trials autoshape slowly, if at all, whereas autoshaping to a lighted key readily follows 10 magazine trials (Steinhauer *et al.*, 1976). Clearly, considerable additional research using appropriate control conditions will be required to identify those portions of the present procedure responsible for key pecking, and to address questions about the comparability of autoshaping with visual and auditory stimuli. Of particular current interest is that key pecking was not only initiated but also maintained at a high level when the response was directed toward an auditory stimulus, rather than a lighted key.

G. D. STEINHAUER,
G. H. DAVOL,
and A. LEE
University of Montana

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¹Reprints may be obtained from G. D. Steinhauer, Department of Psychology, University of Montana, Missoula, Montana 59812.

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