THE RAT: AN IMPORTANT SUBJECT¹

JAMES B. APPEL

YALE UNIVERSITY SCHOOL OF MEDICINE

Many scientists who study behavior over extended periods of time in individual organisms have been gradually losing interest in the rat. There are, of course, good reasons for this. Other species (*e.g.*, pigeons and monkeys) live longer and undoubtedly have more acute sensory capacities than rodents, and studying man himself or species which are phylogenetically close to him pays many dividends. As laboratory animals, rats also leave much to be desired. In addition to living a relatively short time (2 to 3 years), they tend to become ill and sometimes interrupt experiments by dying. Often, they are reluctant to press a bar to avoid shock and instead "freeze" or crouch in a dark corner of an experimental chamber.

Nevertheless, the rat has its advantages. They are inexpensive, much is known about their care and maintenance, and they are of great value in the study of physiological and pharmacological variables. Moreover, these beasts have been the subject of at least 90% of the literature in animal behavior and they are still being run in straight alleys, mazes, and shuttle boxes around the world.

That they are not stupid can be shown by results obtained with the following general procedure; performances on a multiple schedule were obtained in albino rats at least as good as any of pigeons, monkeys, or men. The only discriminative stimulus was a change in general illumination.

The apparatus was a standard Lehigh Valley (Model 1316) chamber housed in a sound- and light-attenuated shell (LVE Model 1316C). The experimental space was equipped with a single lever, a dim overhead house light, a "feedback" light directly above the lever and a liquid feeder (dipper). A

force of 7.5 g activated the lever and each reinforcement consisted of 0.05 ml of a diet of eggs, sweetened milk, and vitamins.

The animals were trained to press the bar in the presence of the dim house light on FR 1 (CRF); each response was followed by a brief flash of the "feedback" light. The ratio was

Fig. 1. Cumulative response curves for three rats on Mult 30 light FI 4 dark. Complete 2-hr sessions are shown. Vertical marks signify reinforcements; changes in stimulus conditions and experimental contingencies are not indicated except by the animals' behavior.

¹This research was supported in part by Public Health Service Research Grant MH-03363, from the National Institute of Mental Health. The support of D. X. Freeman, M.D. is also gratefully acknowledged.

gradually raised to FR 30. A fixed-interval component was then introduced and the house light was turned off. This interval was slowly increased from FI 1 to FI 4. Intervals and ratios alternated in random fashion after

reinforcement with the restriction that not more than five ratios or intervals were programmed successively. Three stable performances on Mult FR 30 light FI 4 dark are shown in the figure.