USE OF A CUMULATIVE RECORDER TO INDICATE "CORRECT" RESPONSES

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In discrimination training it is sometimes useful to know for any one stage in the animal's progress the percentage of all responses made in the presence of S^D .

A conventional cumulative recorder can be used to let the animal itself draw a graph of this percentage. Preset a timer to let the motor drive the pen along the abscissa to show, say, an S^A response for a distance equal to that by which the stepper moves the pen along the ordinate for an S^D response. If the organism emits S^A responses while the timer is in the process of recording an S^A response, an add-subtract stepper is used as a storage-device until the timer has timed out and is ready to record them. The common of the stepper is connected to the operating stud of the timer which drives the recorder pen. The null position of the stepper is left open, while the 1 through n positions are connected to ground. Any S^A response activates the "add" coil, which starts the timer; the time out report of the timer activates the "subtract" coil.

The cosine of the angle formed on the cumulative record between the curve the pen draws and the abscissa, yields a value between 0 and 1 which, when multiplied with 100 will give the percent of correct responses for the case described here, where S^D responses are recorded along the ordinate and S^A responses along the abscissa. An overlay with angles drawn at 0° , 9° , 18° , 27° . . . 90° will permit immediate reading off of the percentage of "correct" responses. A perfect discrimination

Fig. 1. Sample records of S^D and S^A responses of two animals under different schedules of reinforcement.

under this arrangement will yield a straight vertical line on the record: the organism emitted only S^D responses.

On the sample records shown in Fig. 1, Rat P was up to S^A response 400 on the following schedule:

where $S_1 = S^D$, $S_2 = S^A$, $T_1 = T_2 = 30$ sec, R = lever press, R_r = food. From S^A response 401 on, this schedule was changed to:

where the symbols have the same meaning as above.

Rat M was placed on this latter schedule from the first response on. The record for each of the animals represents a 60-min session.