

PSYCHOLOGY

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ABSTRACTS

The Criterion in Speech Communication in Noise. JAMES P. EGAN, Indiana University.—The importance of the operating characteristic in speech communication is discussed. Three situations are described in which communications operators must use a criterion. These three situations give rise to: (1) the receiver operating characteristic, (2) the source operating characteristic, and (3) the monitor operating characteristic.

On the Relationship between Kappa and Auditory Fatigue. JAMES D. MILLER, Indiana University.—A hypothesis is presented which attempts to account for the 4000 cps "dip" in the temporary hearing loss audiogram resulting from the exposure of the ear to uniform spectrum noise. This hypothesis states that the amount of temporary hearing loss, THL, observed at any frequency is determined by the level per cycle intensity of the noise, B; the width of the critical band in decibels, K; and the quiet absolute threshold, QAT; according to the equation:

$$THL = F(B + K - QAT).$$

Data are presented which show that while the hypothesis results in predictions showing the general contours of the observed temporary hearing loss audiograms, it consistently predicts too large THL's at the lower frequencies and too small THL's at the higher frequencies. The prediction is made by using the graph of the observed THL's at 4000 cps plotted against $(B + K - QAT)$.

Minimum Separable Acuity of Vision in the Raccoon. JOHN I. JOHNSON, JR., Purdue University.—To investigate the visual acuity of raccoons (*Procyon lotor*) as it pertains to laboratory testing situations, from the aspect of the minimum separation that can be detected, the chain pulling method of Warden, Fjeld and Koch was used. This method requires the animal to pull in that one of two chains to which a food cup is attached. The distance between the chains is systematically varied, and the relative success of the animal in choosing the correct chain at these various separation intervals provides an indication of his perceptual ability. All three raccoons tested were capable of discrimination when the distance between the chains, at the end where the food cup was attached, which was always 14 inches from the animal's eye, was 3 inches or more. Performance deteriorated progressively for smaller distances, although the evidence indicates that rac-

coons, at least occasionally, can at this distance discriminate separations as small as $\frac{1}{4}$ inch.

The Vocational Interest Patterns of Students Who Stay in Engineering Compared With Those Who Leave the Engineering Curriculum. N. M. DOWNIE, Purdue University.—Seven hundred and five students entering the engineering curricula of Purdue University in the fall of 1950 were given the Kuder Preference Record, Vocational. In th spring of 1954 a random sample of 90 students still in engineering and of 88 who had dropped from school was drawn. Eighty-eight other students who had changed from engineering to other schools of the university were also studied.

Means for these three groups on each of the scales of the Kuder were computed and tests for significant differences were made using F and "t" tests.

It was found that those students who remained in engineering scored significantly higher (1% level) on the scientific scale than the other two groups. These same students and those who had dropped from school both scored significantly higher (1% level) than those who had transferred on the computational key. The drop-outs scored significantly higher (5% level) than the transfers on the clerical key, and those still in engineering tended to score higher on this scale. Those who transferred (mostly to arts and sciences) scored significantly higher (5% level) than the other two groups on the literary scale. The students who left the university scored significantly higher (5% level) than those still in engineering on the artistic key. On the other scales there were no significant among the three groups.

The Scaling of Words to Describe Personality. ARNOLD BUSS and HERBERT GERJUOY, Carter Memorial Hospital, Indianapolis and Indiana University.—Adjectives descriptive of personality were scaled for intensity and abnormality by clinical psychologists. Prior to scaling, each adjective was assigned to one of 18 dimensions of personality. On each dimension intensity was taken to be a bi-polar attribute ranging from excess to deficiency; while abnormality was taken to be uni-polar, ranging upward from hypothetical zero abnormality. For the intensity scaling 42 judges rank-ordered the adjectives within each dimension. Hull's procedure was used to obtain scale values. For the abnormality scaling 24 judges rated each adjective on a scale from 1 to 9. Scale values were obtained by taking the means of the ratings. There was a high non-linear relationship between intensity and abnormality means. Minimum abnormality means were obtained for adjectives falling in the middle of the intensity scale, and large abnormality means were obtained for adjectives falling at either extreme of intensity. These scale values may be used to help set up a standard descriptive nomenclature in both clinical and research work involving personality description.

Reduction in Effect of Prior Exposure on Escape-from-Shock Training by Reduction in Duration of Pulse. JAMES A. DINSMOOR, Indiana University.—A technical difficulty which has arisen in escape-from-shock

training studies is that prior exposure to inescapable shock slows down subsequent acquisition of escape behavior. This study is an attempt to reduce this "adaptation" effect by: (a) reducing the length of successive pulses of shock; and (b) depriving half the subjects of food.

Twenty-four male albino rats, aged about 4½ months, were used as subjects. The test procedure for all animals was a fifty minute session in the bar-pressing apparatus, in which each press-and-release sequence in the presence of 200 microampere shock terminated the shock for twenty seconds, followed by its reappearance. Seventy-eight pulses were presented per minute for each electrode in contact, with a pulse duration of .048 seconds. Half of the animals were exposed on the previous day to fifty minutes of inescapable 400 microampere shock, for a stringent test; their controls were placed in the apparatus with no charge on the grid. Further, half of each of these groups was fed ad lib, the other half maintained on a 1 hour feeding, 23 hour fasting cycle. Experimental sessions came immediately before feeding.

Non-reinforced responding prior to training was significantly ($p < .001$) higher for shocked than non-shocked animals. An analysis of variance for number of escape responses in training showed that prior exposure to shock remained a significant ($p < .01$) variable, even with the shorter pulse, but that the drive-exposure interaction fell short of significance. A comparison of the ad lib animals with corresponding animals from a previous study using the same conditions except for a 33⅓ per minute, .113 second shock pulse did show a significant ($p < .001$) interaction between pulse-duration and exposure, indicating that the reduction in pulse duration did reduce the "adaptation" effect.

Externally-aroused Drives in the Raccoon. RICHARD I. THACKRAY and KENNETH M. MICHELS, Purdue University.—The present study was designed to study the effectiveness of manipulatory objects as incentives for the learning of a simple position response. Using a single unit T-maze raccoons were tested with the stimulus objects located in one of the goal cages. After the learning series a reversal series was conducted following which satiation effects were studied. Both latency of entry into the correct goal cage and manipulation time were measured. While there were marked individual differences between animals, significant changes in latency were obtained during the learning and reversal series. For three of the animals a significant increase in manipulation occurred during the learning series followed by a significant decline during the satiation series.

The Relation Patterns of Magnitudes of the QRS Complex to Rote Learning. R. N. BERRY, Indiana University.—Continuous EKG records were obtained from 16 male Ss during the learning of a nine item nonsense syllable list. Learning trials were given to a criterion of one correct trial. The magnitude of the QRS component of every heart beat was measured and plotted in relation to the action of the memory drum on which the syllables were presented. There appears to be a more orderly pattern of the QRS magnitudes as learning progresses, although the pattern differs from S to S. This finding will be presented

in a qualitative way by showing the plotted data for selected trials. It will be suggested that part of the final pattern is a product of breathing patterns and that these are necessary for the appearance of the desired responses. It will be suggested even more generally that verbal learning is in part a matter of achieving coordination of the necessary muscle groups.

The Sampling of Common Elements in Discrimination Learning. DAVID L. LABERGE and ADRIENNE SMITH, Indiana University.—This experiment was an attempt to test the probability assumption of certain statistical learning models. The hypothesis derived from the assumption was that subjects responding at or very near unity to each signal in a discrimination task would not be sampling elements common to the signals.

The 207 subjects were given 284 trials on successive discrimination tasks of two levels of difficulty, both involving simple figures. Interspersed among these trials were test signals, involving background stimuli only. The mean proportion of A1 responses to these blank signals was taken as a measure of the status of the common elements. When the partial reinforcement schedule associated with background stimuli was abruptly changed, those Ss which had reached a near unity level of responding did not change their level of response to the blank signals. This was interpreted as indicating that they were not sampling common elements and the probability assumption was therefore supported.

Terminal Probability of a Positional Response Following Three Types of Training. TERESA S. CARTERETTE, Indiana University.—A comparison was made of the mean terminal probability of a reinforced position response following training under three correction procedures and two reinforcement schedules. The aim was to investigate the applicability of statistical learning theory to acquisition in a T maze when the stimulus situation on training and test trials differs in varying proportions.

By placing a barrier in that arm of a T maze leading to the empty goal box, food deprived rats were trained to run into the goal box containing food reinforcement. The location of the barrier differed for each of three pairs of training groups. Barrier position determined the degree of similarity between the training and test trial situations. In the Correction Groups the rats could traverse the entire length of the maze arm leading to a locked empty goal box before turning to run into the arm leading to the goal box containing reinforcement. The rats in the Intermediate Correction Groups could travel over the first six inches of the maze arm leading to the empty goal box; and those in the Forced Groups could not enter this arm at all. Within each of these three training procedures, one group was continuously reinforced on one side; and the other group was randomly reinforced, 75% of the time on one side and 25% on the other. On test trials the maze was identical for all groups: either arm and goal box could be entered and neither goal box contained food. All groups received a

twenty-three day Acquisition Series followed by a sixteen day Reversal Series. A correct response was a goal box entry on the predominantly reinforced side. Eighty-four female hooded rats were used.

The mean terminal probabilities for correct responding in the 100% groups corresponded in rank to the degree of similarity between training and test situations and ranged from .97 for the Correction Group to .77 for the Forced Group. No such ranking was observed for the 75% groups; but the mean terminal probability of a correct response in the Initial Series did not differ significantly from the probability of reinforcement. For both series, analyses of variance testing the overall differences among the mean terminal probabilities for correct responding yielded F 's significant at the 5% level of confidence only for the differences between reinforcement conditions.

The prediction from statistical learning theory that the probability of a response at the asymptote of learning will equal its probability of reinforcement was supported. Such departures as were observed in the 100% Forced Group can be encompassed by the model for simple two-choice learning if the difference between training and test trials is taken into account in the mathematical analogue of the experimental situation.