

THE RELATIONSHIP BETWEEN FEAR AND STEREOTYPED  
VERSUS NON-STEREOTYPED TASKS

APPROVED:

*Jack R. Hayner*  
Major Professor

*Loy L. Sullivan*  
Minor Professor

*Dwane Kingery*  
Dean of the School of Education

*Robert B. Toulouy*  
Dean of the Graduate School

THE RELATIONSHIP BETWEEN FEAR AND STEREOTYPED  
VERSUS NON-STEREOTYPED TASKS

THESIS

Presented to the Graduate Council of the  
North Texas State University in Partial  
Fulfillment of the Requirements

For the Degree of

MASTER OF ARTS

By

Norris P. Sonntag, B. A.

Denton, Texas

January, 1968

TABLE OF CONTENTS

LIST OF TABLES. . . . .	Page iv
Chapter	
I. INTRODUCTION . . . . .	1
II. METHOD . . . . .	13
III. RESULTS AND DISCUSSION . . . . .	20
IV. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS. . . . .	31
BIBLIOGRAPHY. . . . .	35

LIST OF TABLES

Table	Page
I. Summary of Analysis of Variance for Mean GSR Scores Between Pre- and Post-Threat Trials and Groups Performing Tasks S and N. . . . .	20
II. Summary of $t$ Test for Unequal Groups Between Mean Reaction Time Scores For Task N and Task S . . . . .	21
III. Summary of $t$ Test Between Pre- and Post-Threat Trials for Task S. . . . .	22
IV. Summary of $t$ Test Between Mean Reaction Time Scores of Task N and Task S Performers on Pre-Threat Trials . . . . .	22

## CHAPTER I

### INTRODUCTION

The nature of emotions has long been a central issue in the study of behavior. Hillman (11, pp. 5-12) points out that there is general agreement among authorities about the description of emotion as a complex state of the organism which varies in intensity. It is agreed that emotions involve widespread bodily changes, a mental state of excitement, and usually an impulse towards a specific form of behavior. Much of the disagreement centers around a more exact description of this complex state and any explanation of it.

Some researchers, such as Plutchick (23, pp. 170-171) have emphasized the concept of emotions as a response. He sees the emotional response as being modifiable by learning, but drawing its basic patterns from inborn or physiological mechanisms. For Prince (24, p. 327) and Tuttle (27, p. 61) emotion is an energy state or force within the organism which must find an outlet. Through the process of learning, the organism establishes an acceptable form of behavior which releases this energy. For Watson (29) emotion was an unlearned disruption of organized activity which was inhibited with the advent of learning.

There are many more views on this topic which are certainly worthy of mention. However, the most fruitful approach, in regard to the production of research, has been that initiated with Mowrer's (21) translation of Freud's (9) assumptions about anxiety into stimulus-response terms.

Mowrer proposed that anxiety or fear could motivate trial-and-error behavior. He further contended that a reduction in fear or anxiety could serve as a reward and, in that manner, reinforce the learning of new habits. Mowrer later utilized these two concepts, fear as motivation and fear-reduction as reward, to interpret phenomena ranging from conditioning experiments to rituals and superstitions (19).

Continuing the work of Mowrer (21) and drawing from that of Hull (12), Miller (20) hypothesized that anxiety could be considered a drive. He was able to establish that experimental animals could be taught to fear a formerly neutral stimulus. Further, they could learn to perform a variety of tasks to escape it and prepared to be rewarded by the absence of the fear-inducing stimulus. Miller proposed that this reward was a result of the reduction of the emotional drive level which the animals were experiencing.

Miller later concluded that emotion could be thought of as a learnable or secondary drive. Although the basic emotional

response might be innate, it could be attached to any object through learning principles demonstrated in classical and operant conditioning studies. For Miller, a learnable drive ". . . is one that can be acquired by a preciously ineffective cue as a result of learning" (19).

Since Miller's initial research, a variety of experiments has appeared exploring the properties of fear or anxiety as a drive (3, 5, 18). There exists today ample evidence supporting Miller's hypothesis of anxiety or fear as drive.

#### Related Research

An area of investigation in regard to emotions as drive which has both practical and theoretical importance has been the effects of inducing these drives into on-going behavior patterns. The importance of emotional factors and their effect on learning and performance has been a concern of persons researching problems in industry, school, and military situations (15).

The exact properties of the interaction between emotional drives and other psychological phenomena, however, is still a vastly unexplored field. The purpose of this paper will be to examine further the effects of one of these emotional drives, that of fear, on task performance, and to explore

some of the theoretical conceptualizations already put forth regarding this interaction.

The emotional drive, fear, was selected for several reasons: (1) it is a relatively common drive; (2) it is an intense drive; (3) it is resistant to extinction; and (4) it is easily induced (19).

The tasks selected for this study arose from research conducted by Schachter et al. (25) and Latané and Arrowood (14). Schachter et al. examined the basis for industrial slow-downs which occurred when the nature of the worker's task was modified. They discovered that production disruptions lasted much longer, in some cases, than would be necessary for workers to master the new task.

Schachter et al. (25) concluded that emotional disruptions, which occur in the normal work day of an industrial employee, were the factors involved. They proposed that tasks which the worker has become accustomed to doing and performs automatically, stereotyped tasks, are not obstructed by these everyday emotional disruptions, while those tasks which the worker is in the process of learning and must concentrate on, non-stereotyped tasks, are obstructed. Stereotyped tasks were defined as ". . . the extent to which behavior has an automatized or habitual character, requiring neither concentration, attention, or thought" (25). Non-stereotyped



tasks were perceived as behavior which required closer concentration, attention, or thought.

The results of both experiments, Schachter et al. (25) and Latané and Arrowood (14), were attributed to the entrance of a second emotional drive, frustration. Persons performing a stereotyped task are not disrupted because the behavior is not dependent on close concentration. Persons performing a non-stereotyped task are disrupted because their behavior is dependent on closer concentration. Unable to deal with their emotionality in a cognitive manner, the non-stereotyped task performers become frustrated and thus their ability to perform is lowered.

That the induction of fear or anxiety is disruptive to cognitive processes has been the conclusion of several researchers (8, 31). Brown and Jacobs (5) contended that fear acts to intensify whatever response is dominant at the time. Brown and Farbre (4) held that frustration is the real disrupter of performance, since it occurs whenever conditions are such as to hinder or prevent the occurrence of a response. If cognitive behavior is viewed as a response, its disruption by the induction of anxiety should yield frustration which in turn would disrupt task performance (28). No direct measure has been made in these studies to determine if such an emotional drive, which might be termed frustration, is present. Its

existence has been predicated on inferences drawn from task performance and clinical observation.

That task performance is not disrupted by the induction of fear or anxiety may be indirectly inferred from the clinical observations of Coleman (7, p. 226), Masserman (17, p. 163), Stern (26, p. 94) and Maslow and Mittelman (16; p. 164). These authors hold that in the case of the obsessive-compulsive neurotic, a variety of rituals or tasks of varying complexity are performed to control emotional disruptions and impulses. If this is the case, it would not seem likely that these emotional drives would disrupt task performance, be it stereotyped or non-stereotyped.

Of theoretical concern to this area of study is the position taken by Hull (12, pp. 121-135). He postulated that drive (D) activates habit strength ( $S_{HR}$ ) into reaction potential ( $S_{ER}$ ). In other words, a habit of a given strength should yield responses of greater or lesser magnitude, depending upon the strength of the drive operating at the time the response is evoked (10, p. 133). A simple statement of this postulate is

$$S_{ER} = D \times S_{HR}$$

Drive for Hull was a construct representing the generalized drive strength. A non-specific motivational variable,

it consisted of all the separate need states which are present in an organism at any given time. Need states were classified into two groups, relevant needs, those which are reduced by the response occurring at the time, and irrelevant needs, those which are not being reduced at the time. Drive (D) for Hull was a combination of relevant and irrelevant needs. His formula for drive was

$$D = \frac{\dot{D} + \bar{D}}{\dot{D} + M_D}$$

in which  $\dot{D}$  represents the drive strength contributed by irrelevant needs; and  $\bar{D}$  represents the drive strength contributed by relevant needs; and  $M_D$  represents the maximal motivational strength (2, 12).

According to the formulas for reaction potential ( $S_{E_R}$ ) and drive (D), irrelevant needs will increase the total drive which will in turn increase the reaction potential. That this is not always the case has been demonstrated by Estes and Skinner (7), Kendler (13), and Mowrer and Viek (22). In support of Hull's hypothesis are experiments conducted by Amsel (1), Miller (20), and Webb (30).

It is suggested by Amsel and Maltzman (2) that the addition of irrelevant drives to a motivational complex will tend to increase response strength if the response associated with the irrelevant needs is congruent with the responses associated with the relevant needs. The addition of irrelevant

needs will weaken or block the reaction potential if the responses associated with the irrelevant needs are incongruent with the responses associated with the relevant needs.

It is contended here that Hull's formula for reaction potential ( $S E_R$ ) is incorrect, since the addition of an irrelevant drive will not necessarily lead to an increase in reaction potential (2). However, it is maintained that his formula for drive is correct. Generalized drive, as visualized by Hull, may increase without increasing the reaction potential for any one specific behavioral complex.

#### Purpose of the Study

The three main goals of this study were (1) to help clarify the divergent observations in regard to the effects of an irrelevant emotional drive on task performance; (2) to discover if an irrelevant emotional drive, possible frustration, is present when an organism performing a non-stereotyped task has been subjected to another experimentally induced drive, fear; and (3) if this second irrelevant drive is present, to determine whether it adds to the generalized drive level, regardless of its effects on performance.

#### Hypothesis

It was hypothesized that if two groups trained to maximum performance, one on a stereotyped task and the other

on a non-stereotyped task, were subjected to an irrelevant emotional drive, fear, induced by the threat of electrical shock, then on subsequent trials the following would occur:

1. The non-stereotyped task group would show a reduction in performance as measured by their reaction time and number of errors.

2. The performance of the stereotyped task group as measured by reaction time and number of errors, would remain constant. This was hypothesized because no disrupting frustration should be present to lower their performance, and the addition of the irrelevant drive, fear, cannot increase performance significantly if the subjects are operating at a maximal level.

3. The non-stereotyped task group would exhibit a higher emotional drive level, as measured by the Galvanic Skin Response (GSR), than would the stereotyped task group.

## CHAPTER BIBLIOGRAPHY

1. Amsel, Abraham, "The Combination of Primary Appetitional Need With Primary and Secondary Emotionally-Derived Needs," Journal of Experimental Psychology, XL (February, 1950), 1-14.
2. Amsel, A. and I. Maltzman, "The Effects Upon Generalized Drive Strength of Emotionality as inferred from the Level of Consumatory Response," Journal of Experimental Psychology, XL (November, 1950), 563-569.
3. Brimer, C. J. and L. J. Kamin, "Fear of the Conditioned Stimulus in Avoidance Training and Fear From a Sense of Helplessness," Canadian Journal of Psychology, XVII (March, 1963), 188-193.
4. Brown, J. S. and I. E. Farber, "Emotions Conceptualized as Intervening Variables, With Suggestions Toward a Theory of Frustration," Psychological Bulletin, XLVIII (June, 1951), 465-495.
5. Brown, J. S. and A. Jacobs, "The Role of Fear in the Motivation and Acquisition of Responses," Journal of Experimental Psychology, XXXVI (August, 1949), 747-749.
6. Coleman, James C., Abnormal Psychology and Modern Life Chicago, Scott Foresman and Co., 1964.
7. Estes, W. K. and B. F. Skinner, "Some Quantitative Properties of Anxiety," Journal of Experimental Psychology, XXIX (February, 1941), 390-400.
8. Fitzgerald, D. and D. P. Ausubel, "Cognitive Versus Affective Factors in the Learning and Retention of Controversial Material," Journal of Educational Psychology, LIV (April, 1963), 73-84.
9. Freud, Sigmund, The Problem of Anxiety, New York, Norton, 1936.

10. Hilgard, Ernest R., Theories of Learning, New York, Appleton-Century-Crofts, Inc., 1956.
11. Hillman, James, Emotions, Evanston, Illinois, Northwestern University Press, 1961.
12. Hull, Clark L., Principles of Behavior, New York, D. Appleton-Century Co., 1943.
13. Kendler, H. H., "Drive Interaction: I. Learning as a Function of the Simultaneous Presence of the Hunger and Thirst Drives," Journal of Experimental Psychology, XXXV (March, 1945), 96-109.
14. Latané, B. and A. J. Arrowood, "Emotional Arousal and Task Performance," Journal of Applied Psychology, XLIII (May, 1963), 324-327.
15. Lazarus, R. S., J. Deese, and S. F. Osler, "The Effects of Psychological Stress Upon Performance," Psychological Bulletin, XLIX (July, 1952) 293-315.
16. Maslow, A. H. and B. Mittleman, Principles of Abnormal Psychology, New York, Harper and Brothers Publishers, 1941.
17. Masserman, Jules H., The Practice of Dynamic Psychiatry, Philadelphia, W. B. Saunders Company, 1955.
18. McAllister, W. R. and D. E. McAllister, "Postconditioning Delay and Intensity of Shock as Factors in the Measurement of Acquired Fear," Journal of Experimental Psychology, LXIV (February, 1962), 110-116.
19. Miller, Neal E., "Learnable Drives and Rewards," Handbook of Experimental Psychology, edited by S. S. Stevenson (New York 1965), pp. 435-472.
20. Miller, Neal E., "Studies of Fear as an Acquired Drive: I. Fear as Motivation and Fear-Reduction as Reinforcement in the Learning of New Responses," Journal of Experimental Psychology, XXXVIII (June, 1948), 89-101.
21. Mowrer, O. H., "A Stimulus-Response Analysis of Anxiety and its Role as a Reinforcing Agent," Psychological Review XLVI (March, 1939), 553-564.

22. Mowrer, O. H., and P. Viek, "An Experimental Analogue of Fear From a Sense of Helplessness," Journal of Abnormal and Social Psychology, XLIII (April, 1948), 193-200.
23. Plutchik, Robert, The Emotions, New York, Random House, 1962.
24. Prince, Morton, "Can Emotion Be Regarded as Energy", Feeling and Emotions, International Symposium, Worcester, Massachusetts, Clark University Press, 1928.
25. Schachter, S., B. Willerman, L. Festinger, and R. Hyman, "Emotional Disruption and Industrial Productivity," Journal of Applied Psychology, XLV (August, 1961), 201-213.
26. Stern, Paul J., The Abnormal Person and His World, Princeton, New Jersey, D. Van Nostrand Company, 1964.
27. Tuttle, Harold S., How Motives Are Educated, New York, Edwards Brothers Inc., 1941.
28. Wagner, Allen, "Conditioned Frustration as a Learned Drive," Journal of Experimental Psychology, LXVI (September, 1963), 142-148.
29. Watson, J. B., Psychology From the Standpoint of a Behaviorist, Philadelphia, Lippincott, 1919.
30. Webb, W. B., "The Motivational Aspects of an Irrelevant Drive in the Behavior of the White Rat," Journal of Experimental Psychology, XXXIX (April, 1949), 1-14.
31. Wittrock, M. C. and T. R. Husek, "Effect of Anxiety Upon Retention of Verbal Learning," Psychological Bulletin, X (January, 1962), 78.



## CHAPTER II

### METHOD

#### Subjects

The subjects were twenty college students enrolled in a sophomore level psychology class. Involvement in the experiment was voluntary.

The subjects were divided by sex and assigned alternately, according to the order in which they volunteered, to one of two groups. There were five males and five females in each group.

#### Instruments

To measure the emotional drive level of the subjects, a psychogalvanometer (GSR) was used (2, 5, 6). The instrument was model No. 601c, manufactured by the Lafayette Instrument Company. Two finger electrodes, coated with electrode jelly (EKG Sol) were attached to the subject's first and last fingers of the hand opposite the one used for writing.

One problem which arose with the use of this instrument is that physical work or muscular tension is accompanied by lowering of skin resistance (4). Since the task to be performed

by both groups required some physical activity, five precautions were taken in an attempt to control this effect: (1) the amount of muscular movement necessary was kept to a minimum; (2) the hand opposite that used to perform the task was the one to which the electrodes were connected; (3) the hand to which the electrodes were connected was stabilized as much as possible by taping it to the table at which the experiment was conducted and by asking the subject to refrain from moving it; and (4) the psychogalvanometer was rebalanced after the practice trials of the task to correct for the effects of muscular activity.

The tasks assigned to each group were performed on a Basic Visual Choice Reaction Time Set (BVCRTS). The instrument consisted of a panel with a bank of three lights beneath which was a bank of three levers. When one of the three lights was switched on by the Experimenter, the subject could extinguish it by pressing one of the three levers. A timing device connected to the apparatus measured the subject's reaction time from the presentation of the stimulus to the subject's response.

To aid in the induction of anxiety, a dummy electrical shock instrument was devised. It consisted of a discarded transformer, used in fluorescent lighting systems, mounted on a plywood base. An electrical cord, which was plugged into

a wall socket, was attached to the transformer; a rheostat and a toggle switch were also connected, as were two dummy electrodes. The dummy electrodes were attached to a leather strap which could be fastened to the subject's ankle. Care was taken to make the device as authentic in appearance as possible.

#### Procedure

The subjects were conducted, individually, into a vacant classroom where the experiment was held. The psychogalvanometer and the BVCRTS were placed on a table in full view of the subjects, but the dummy electrical shock instrument was sitting on the floor, covered by a cardboard box.

The experimenter introduced himself, had the subject sit at the table and then recorded the name and sex of the subject. The subjects were then told that the purpose of the experiment was to measure some of the physiological factors involved when a person is performing a certain type of task.

The subjects were told that the psychogalvanometer was designed to measure these factors. The handedness of the subject was determined, and the electrodes, after being coated with electrode jelly, were attached to the first and last fingers of the non-dominant hand. That hand was taped to the table and the subjects were asked to refrain from moving it as possible. The psychogalvanometer was then balanced.

The panel containing the three lights and the three levers was shown to the subjects. Those selected to perform the stereotyped task (Task S) were told that one of the three lights would be switched on, and that their task was to extinguish it by pressing the lever directly beneath it. They were asked to do this as rapidly and as accurately as possible.

The subjects in the group to perform the non-stereotyped task (Task N) were shown the same instrument. They were told that when one of the three lights was switched on, their task was to extinguish it as rapidly and as accurately as possible by pressing the appropriate lever.

It was explained that the appropriate lever varied with three conditions, red, blue, and green, which would be verbally indicated by the experimenter just prior to the light's coming on. Under condition red, the appropriate lever was the one just to the right of the light, except in the case of the light on the extreme right, when the appropriate lever was the one on the extreme left. Under condition blue, the appropriate lever was the one just to the left of the light, except in the case of the light on the extreme left when the appropriate lever was the one on the extreme right. Under condition green, the appropriate lever was the one directly beneath the light. Approximately one second before the

presentation of the light, the experimenter told the subject which condition was operating.

The subjects in both groups, those selected to perform Task S and those selected to perform Task N, practiced their respective task for a minimum of fifty-four trials, or until they were able to complete nine trials consecutively without pressing the wrong lever. Further practice, in addition to the fifty-four trials, was necessary for only two subjects, both performing Task N.

After completion of the practice trials, the psychogalvanometer was re-balanced for all subjects. Both groups were then given nine additional test trials in which reaction time and GSR readings were recorded after each trial. No errors (pressing an inappropriate lever) were observed to occur in either group.

The experimenter then read the following statement to the subjects in both groups:

I would like to ask you some questions about your health. Have you ever had rheumatic heart disease? (pause) Buerger's disease? (pause) Raynaud's disease? (pause) Good. The following procedure is safe if you are in good health. I would like to make some comparisons to the physiological reactions I have just recorded to the stress of an electric shock. Do I have permission to administer, during the next ten minutes, some electric shock to the ankle? (pause) The shocks will each last about one second, and they will be distributed over a ten minute time period (1).

The experimenter then uncovered the dummy electrical shock instrument, and placed it on the table. The subject's view of the instrument was partially obstructed by the psychogalvanometer. The experimenter pretended to adjust the rheostat and flipped the toggle switch on and off. The subjects were then shown the dummy electrodes and told that they would deliver the electrical shock. The leather strap to which the electrodes were connected was fastened to the subject's right ankle.

All subjects continued with nine retest trials. The reaction time, GSR readings, and number of errors were recorded after each trial. The appropriate responses for Tasks N and S were the same for the test and re-test trials, although the stimuli were necessarily different.

After completion of the nine re-test trials, the subjects in the two groups were led to believe that the experimenter had decided to use their scores in his control group and for that reason, no shock would be administered. The dummy electrical shock electrodes and the GSR electrodes were removed and subjects were asked not to disclose any of the procedure of the experiment to any one. They were thanked for their participation and dismissed.

## CHAPTER BIBLIOGRAPHY

1. Baker, L. M. and W. M. Taylor, "The Relationship Under Stress Between Changes in Skin Temperature, Electrical Skin Resistance, and Pulse Rate," Journal of Experimental Psychology, XLVIII (May, 1954), 361-366.
2. Barclay, Martin, "Galvanic Skin Conductance as a Function of Successive Interviews," Journal of Clinical Psychology, XLIII (February, 1956), 91-94.
3. Katkin, Edward S., "Relationship Between Manifest Anxiety and Two Indices of Autonomic Response to Stress," Journal of Personality and Social Psychology, II (March, 1956), 325-333.
4. McCleary, Robert A., "The Nature of the Galvanic Skin Response," Psychological Bulletin XLVII (July, 1950), 97-117.
5. McGinnies, Elliot, "Emotional and Perceptual Defenses," Psychological Review, LVI (March, 1949), 244-251.
6. Schlosberg, Harold, "Three Dimensions of Emotion," Psychological Review, LXI (January, 1954), 81-88.

## CHAPTER III

### RESULTS AND DISCUSSION

#### Results

Means were computed for the nine pre-threat trials and nine post-threat trials for the GSR readings and the reaction times of all subjects to facilitate handling of the data. No statistical treatment was given the errors, since they were not numerous enough to have statistical importance.

To discover if the emotional drive level of all subjects was significantly increased by the threat of electrical shock and to discover if this increase was greater for Task N performers than for Task S performers, an analysis of variance was computed.

TABLE I

SUMMARY OF ANALYSIS OF VARIANCE FOR MEAN GSR SCORES  
BETWEEN PRE- AND POST-THREAT TRIALS AND GROUPS  
PERFORMING TASKS S AND N

Source of Variation	df	MS	<u>F</u>	<u>P</u>
A: Between Tasks	1	4601.030	4.2713	NS
Error A	18	1077.180	. . .	. . .
B: Pre- and Post-Threat	1	21669.030	32.364	.01
AB	1	.620	. . .	NS
Error W	18	669.547	. . .	. . .



The analysis of variance, Lindquist Type I for Repeated Measures, was run on the mean GSR scores, and the results of the trials for the two groups are shown in Table I.

A  $\underline{t}$  test for unequal groups was computed between mean reaction time scores for the groups performing Task N and the group performing Task S in an attempt to determine if increased emotionality affected these two tasks differently. The results were as follows:

TABLE II  
SUMMARY OF  $\underline{t}$  TEST FOR UNEQUAL GROUPS BETWEEN  
MEAN REACTION TIME SCORES  
FOR TASK N AND TASK S

Variables	M	SD	$\underline{t}$	$\underline{P}$
Task N	.37	.0538	.5200	NS
Task S	1.38	.0095	. . .	. .

To determine the effects of increased emotionality on the performance of Task S, a  $\underline{t}$  test was computed for the mean reaction time scores between the pre- and post-threat trials. The results were as follows:

TABLE III  
 SUMMARY OF  $t$  TEST BETWEEN PRE- AND POST-THREAT  
 TRIALS FOR TASK S

Variables	M	SD	$t$	$P$
Pre-Threat Trials	.402	.0255	.875	0.3
Post-Threat Trials	.338	.0557	. . .	. . .

To lend support to the assumption that Task N required more attention, concentration, or thought than did Task S, a  $t$  test was computed between the mean reaction time scores of Task N and Task S performers for the pre-threat trials. It was felt that if it could be demonstrated that Task N performers required significantly longer to make the same response as Task S performers, then some cognitive activity might be inferred. The results were as follows:

TABLE IV  
 SUMMARY OF  $t$  TEST BETWEEN MEAN REACTION TIME SCORES OF  
 TASK N AND TASK S PERFORMERS ON PRE-THREAT TRIALS

Variables	M	SD	$t$	$P$
Task N	.545	.0109	16.25	.01
Task S	.402	.0255	. . .	. . .

### Discussion

The three hypotheses suggested by this paper were as follows:

1. The non-stereotyped task group would show a reduction in performance.
2. The performance of the stereotyped task group would remain constant.
3. The non-stereotyped task group would exhibit a higher emotional drive level than would the stereotyped task group.

Of these three, only the second was supported. It may be concluded that under increased emotional drive level, induced by the threat of electrical shock, the reaction time of persons performing a stereotyped task is not lowered.

The data indicated that the emotional drive level of the subjects in both groups, those performing Task N and those performing Task S, was significantly increased by the threat of electrical shock. However, the emotional increase for Task N performers above that of the Task S performers was not significant at the .05 level.

The data also indicated that the mean reaction time scores of the Task N performers was slower than that of the Task S performers. This was felt to strengthen the assumption that Task N required more attention, concentration, or thought than did Task S.

The failure of the non-stereotyped task group to show decreased performance as measured by reaction time may be attributed to one of several factors: (1) an insufficient number of subjects, (2) confounding variables in Task N, and (3) an unidentified learning variable which was present in the studies of Schachter et al. (8) and Latané and Arrowood (4) but not present in this study.

The relatively small number of subjects chosen for this study may have been insufficient to ascertain correctly this phenomenon. However, the statistical findings did not even approach significance at the 0.1 level. There was, then, apparently no trend in the desired direction.

Confounding variables in Task N may have been at fault. Under condition green, the subjects performing Task N were to press the lever directly beneath the light which was switched on. Except for the experimenter's verbal indication of the condition operating, this was exactly the same type of task performed by the Task S group. Condition green constituted one-third of the stimuli presented in all trials for Task N. However, the response times occurring under condition green did not seem to differ markedly from those occurring under conditions blue or red.

In the studies conducted by Schachter et al. (3) and Latané and Arrowood (4) part of the cognitive process involved

in the non-stereotyped task was the actual learning of that task. In the present study, subjects received prior training on the task until no errors were observed for nine consecutive trials. It may be that learning of motor tasks is disrupted by the induction of irrelevant emotional drives, but the actual performance, once learned, is not disrupted, even though it may require close attention, concentration or thought. Studies dealing with cognitive disruptions by emotions have dealt primarily with the acquisition of a behavior pattern or verbal performances (2, 5, 10).

Since excessive emotionality was not or could not be established among Task N performers, no conclusions in regard to Hull's (3) position on drive (D) could be drawn. The failure of the non-stereotyped task group to exhibit a significantly higher emotional drive level than the stereotyped task group may be attributed to one of several factors: (1) an insufficient number of subjects to ascertain properly the phenomenon, (2) inability of the psychogalvanometer used to measure sensitively enough the existing emotion, and (3) the absence of an additional irrelevant emotional drive which would have increased the total drive level.

It is possible that additional subjects would have exhibited increased emotionality among the task N performers, since statistical results approached the .05 level of significance.

It is also possible that the instrument used for measuring the GSR was not sensitive enough to detect the presence of an additional emotional drive. The instrument which was available was designed more for demonstration purposes than research.

That an additional emotional drive was not present is, however, more plausible. If this drive were present, theoretically it should have induced or been accompanied by disruptions in the performance of Task N. Disruption in the performance of Task N was not suggested by the data.

In the light of the results, it would appear that motor tasks which require attention, concentration, or thought but which have already been learned, are not disrupted by the introduction of such an irrelevant emotional drive as fear. Since there is no emotional blockage of the cognitive processes, frustration does not occur, and task performance is not disrupted.

Motor tasks which require little or no attention, concentration, or thought are not disrupted by the induction of such an irrelevant emotional drive as fear after they have been learned. Whether or not they are disrupted by such drives during acquisition cannot be demonstrated by this study, by that of Schachter et al. (8), or by that of Latané and Arrowood (4). It is hypothesized, however, that they would

be disrupted. Essentially, what is being suggested here is that the learning process is disrupted by the induction of irrelevant emotional drives but that such other cognitive processes as attention, concentration, or thought are not.

This interpretation of the relationship between irrelevant emotional drives and task performance would seem to fit clinical observations involving obsessive-compulsive neurosis. Coleman points out that, in regard to the compulsive reaction:

. . . the inadequate neurotic may attempt to maintain some semblance of order and control by becoming unduly meticulous and methodical. A rigid pattern provides some security and predictability and helps to prevent anything from going wrong (1, p. 266).

These rigid behavior patterns may involve the repetition of some verbal chants, the enactment of some ritualistic motor behavior, both, or a combination of both (7, pp. 163-164). The repetitive ritualistic behavior reaction will concern us most here.

Stern has observed that these rituals may consist of the repetition of some simple act. In other cases, a whole string of obsessive acts is elaborated into an "intricately complex and drawn-out ritual which must be performed with deadly accuracy" (9, p. 94). Since they are repetitive in nature (1, p. 227) and of varying degrees of complexity (9, p. 94), rituals appear to coincide relatively well with acquired stereotyped and non-stereotyped tasks.

If this behavior is utilized to contain unruly emotional drives and impulses, as is contended by Coleman (1, p. 227), Masserman (6, p. 387) and Maslow and Mittelman (7, p. 161), neither stereotyped or non-stereotyped tasks would be easily disrupted by the induction of this emotionality. Non-stereotyped tasks may possibly serve this purpose by focusing the neurotic's attention and concentration on less threatening behavior. Stereotyped tasks possibly function as a substitute for less acceptable or threatening behavior.

Masserman (7, p. 164) noted that, should the accustomed ritual of the compulsive fail to function due to increased stress, a restless anxiety appears which leads to the formation of new and more elaborate rituals. If non-stereotyped tasks function as distractors, they may be more valuable to the compulsive than the stereotyped tasks in dealing with a wider spectrum of situations. However, stereotyped tasks possibly have a stronger resistance to specific kinds of stress.

This last contention is tentatively supported by the data. The  $t$  test computed between mean GSR scores for Task N and Task S performers approached significance at the .05 level, suggesting that possibly there was a trend towards more emotionality in the Task N performers. That ritualistic behavior increases in complexity suggests that it is more adaptable to a variety of situations. Regression to earlier



rituals occasionally observed in obsessive-compulsive individuals (7, p. 165) may represent a retreat to safer, more stereotyped tasks in the face of increased stress.

Although much of this analogue is supposition, it appears to fit clinical observations more closely than does the position taken by Schachter et al. (8) and Latané and Arrowood (4). Clearly, this is a fertile field for further research.

## CHAPTER BIBLIOGRAPHY

1. Coleman, James C., Abnormal Psychology and Modern Life, Chicago, Scott Foresman and Co., 1964.
2. Fitzgerald, D. and D. P. Ausubel, "Cognitive Versus Affective Factors in the Learning and Retention of Controversial Material," Journal of Educational Psychology, LIV (April, 1963), 293-315.
3. Hull, Clark L., Principles of Behavior, New York, D. Appleton-Century Co., 1943.
4. Latané, B. and A. J. Arrowood, "Emotional Arousal and Task Performance," Psychological Bulletin, XLIX (July, 1952), 324-327.
5. Lazarus, R. S., J. Deese, and S. F. Osler, "The Effects of Psychological Stress Upon Performance," Psychological Bulletin XLIX (July, 1952), 293-315.
6. Maslow, A. H. and B. B. Mittelman, Principles of Abnormal Psychology, New York, Harper and Brothers Publishers, 1941.
7. Masserman, Jules H., The Practice of Dynamic Psychiatry, Philadelphia, W. B. Saunders Company, 1955.
8. Schachter, S. B. Willerman, L. Festinger, and R. Hyman, "Emotional Disruptions and Industrial Productivity," Journal of Applied Psychology, XLV (August, 1961) 201-213.
9. Stern, Paul J., The Abnormal Person and His World, Princeton, New Jersey, D. Van Nostrand Company, 1964.
10. Wittrock, M. C. and T. R. Husek, "Effect of Anxiety Upon retention of Verbal Learning," Psychological Bulletin X (January, 1962), 78.

## CHAPTER IV

### SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

#### Summary

This study utilized twenty students enrolled in a sophomore psychology class to examine the effects of the induction of an irrelevant emotional drive, fear, on the performance of stereotyped versus non-stereotyped tasks. Non-stereotyped tasks were defined as those which require attention, concentration, or thought, while stereotyped tasks were considered to be more automatic or habitual in nature. Fear was induced by the threat of electrical shock.

It was hypothesized that if two groups trained to maximum performance, one on a stereotyped task and the other on a non-stereotyped task, were subjected to an irrelevant emotional drive, the following would occur:

1. The non-stereotyped task group would show a reduction in performance.
2. The performance of the stereotyped task group would remain constant.
3. The non-stereotyped task group would exhibit a higher emotional drive level, as measured by the GSR, than would the stereotyped task group.

An analysis of variance and several  $t$ -tests were computed. Of the three hypotheses, only the second was supported.

### Conclusions

It was concluded that stereotyped and non-stereotyped task performances are not disrupted by the induction of such an irrelevant emotional drive as fear once they have been learned. Disruptions in the performance of non-stereotyped tasks may be induced by an irrelevant emotional drive during acquisition. This is probably true also for the performance of stereotyped tasks. It is suggested that learning is disrupted by the introduction of irrelevant emotional drives, but attention, concentration, and thought are not.

The performance of stereotyped and non-stereotyped tasks, once mastered, may actually serve to curb irrelevant emotionality. Stereotyped tasks possibly serve as substitute behavior for less acceptable impulses, while non-stereotyped tasks may function as distractors by causing the organism to attend to the task at hand rather than to the stress it is undergoing. Non-stereotyped tasks are possibly more effective in dealing with general stress, while stereotyped tasks may be more effective in handling specific kinds of stress.

These impressions would appear to fit clinical observations of the obsessive compulsive neurotic. Ritualistic

behavior occurring in this individual's behavior appears to compare closely with both stereotyped and non-stereotyped tasks as described in this paper, in that they are well practiced, are of varying degrees of complexity, and are not disrupted by the induction of irrelevant emotional stress.

Under increased stress, the obsessive-compulsive may experience anxiety which is followed by an increase in the complexity of his rituals. This would tend to indicate that non-stereotyped tasks are more effective in dealing with generalized stress. Regression to an earlier ritualistic pattern, occasionally observed in these individuals, may represent a retreat to more stereotyped tasks which make him feel safer.

#### Recommendations

This study leaves many questions unanswered about the relationship between fear as an irrelevant emotional drive and stereotyped versus non-stereotyped task performance.

One such question is whether or not stereotyped tasks during acquisition are disrupted by the introduction of an irrelevant emotional drive. Indeed, the nature of learning versus attention, concentration, or thought would be further explored.

Another important consideration arises in the choice of irrelevant emotional drives. Different drives may have

properties producing different results under the same conditions.

More attention should also be given to the comparison of stereotyped and non-stereotyped tasks with the ritualistic behavior of the obsessive-compulsive. Further research should check the accuracy of this analogue and clarify the functions of these different tasks, if such a comparison is truly appropriate.

This list is by no means exhaustive. There is a variety of items which should be checked and clarified. It is hoped that the findings of this paper will stimulate further research in this most fruitful area.

## BIBLIOGRAPHY

### Books

- Coleman, James C., Abnormal Psychology and Modern Life, Chicago, Scott Foresm and Co., 1964.
- Freud, Sigmund, The Problem of Anxiety, New York, Norton 1936.
- Hilgard, Ernest R., Theories of Learning, New York, Appleton-Century-Crofts, Inc., 1956.
- Hillman, James, Emotions, Evanston, Illinois, Northwestern University Press, 1961.
- Hull, Clark L., Principles of Behavior, New York, Appleton-Century Co., 1943.
- Maslow, A. H. and B. Mittelman, Principles of Abnormal Psychology, New York, Harper and Brothers Publishers, 1941.
- Masserman, Jules H., The Practice of Dynamic Psychiatry, Philadelphia, W. B. Saunders Company, 1955.
- Miller, Neal E., "Learnable Drives and Rewards," Handbook of Experimental Psychology, edited by S. S. Stevenson (New York 1965), pp. 435-472.
- Plutchik, Robert, The Emotions, New York, Random House, 1962.
- Prince, Morton, "Can Emotion be Regarded as Energy," Feelings and Emotions, International Symposium, Worcester, Massachusetts, Clark University Press, 1928.
- Stern, Paul J., The Abnormal Person and His World, Princeton, New Jersey, D. Van Norstrand Company, 1964.
- Tuttle, Harold S., How Motives are Educated, New York, Edwards Brothers Inc., 1941.

Watson, J. B., Psychology From the Standpoint of a Behaviorist, Philadelphia, Lippincott, 1919.

#### Articles

- Amsel, Abraham, "The Combination of Primary Appetitional Need With Primary and Secondary Emotionally-Derived Needs," Journal of Experimental Psychology, XL (February, 1950), 1-14.
- Amsel, A. and I. Maltzman, "The Effects Upon Generalized Drive Strength of Emotionality as Inferred From the Level of Consumatory Response," Journal of Experimental Psychology, XL (November, 1950), 563-569.
- Baker, L. M. and W. M. Taylor, "The Relationship Under Stress Between Changes in Skin Temperature. Electrical Skin Resistance, and Pulse Rate," Journal of Experimental Psychology, XLVIII (May, 1954), 361-366.
- Barclay, Martin, "Galvanic Skin Conductance as a Function of Successive Interviews," Journal of Clinical Psychology, XLIII (February, 1956), 91-94.
- Brimer, C. J. and L. J. Kamin, "Fear of the Conditioned Stimulus in Avoidance Training and Fear From a Sense of Helplessness," Canadian Journal of Psychology, XVII (March, 1963), 188-193.
- Brown, J. S. and I. E. Farber, "Emotions Conceptualized as Intervening Variables, With Suggestions Toward a Theory of Frustration," Psychological Bulletin, XLVIII (June, 1951), 465-495.
- Brown, J. S. and A. Jacobs, "The Role of Fear in the Motivation and Acquisition of Responses," Journal of Experimental Psychology, XXXVI (August, 1949), 747-749.
- Estes, W. K. and B. F. Skinner, "Some Quantitative Properties of Anxiety," Journal of Experimental Psychology, XXIX (February, 1941), 390-400.
- Fitzgerald, D. and D. P. Ausubel, "Cognitive Versus Affective Factors in the Learning and Retention of Controversial Material," Journal of Educational Psychology, LIV (April, 1963), 73-84.



- Katkin, Edward S., "Relationship Between Manifest Anxiety and Two Indices of Autonomic Response to Stress," Journal of Personality and Social Psychology, II (March, 1956), 325-333.
- Kendler, H. H., "Drive Interaction: I. Learning as a Function of the Simultaneous Presence of the Hunger and Thirst Drives," Journal of Experimental Psychology, XXXV (March, 1956), 96-109.
- Latané, B. and A. J. Arrowood, "Emotional Arousal and Task Performance," Journal of Applied Psychology, XLIII (May, 1963), 324-327.
- Lazarus, R. S., J. Deese, and S. F. Osler, "The Effects of Psychological Stress Upon Performance," Psychological Bulletin, XLIX (July, 1952), 293-325.
- McAllister, W. R. and D. E. McAllister, "Postconditioning Delay and Intensity of Shock as Factors in the Measurement of Acquired Fear," Journal of Experimental Psychology, LXIV (February, 1962), 110-116.
- McCleary, Robert A., "The Nature of the Galvanic Skin Response," Psychological Bulletin, XLVII (July, 1950), 97-117.
- McGinnies, Elliot, "Emotional and Perceptual Defenses," Psychological Review, LVI (March, 1949), 244-251.
- Miller, Neal E., "Studies of Fear as an Acquired Drive: I. Fear as Motivation and Fear-Reduction as Reinforcement in the Learning of New Responses," Journal of Experimental Psychology, XXXVIII (June, 1948), 89-101.
- Mowrer, O. H., "A Stimulus-Response Analysis of Anxiety of Its Role as a Reinforcing Agent," Journal of Abnormal and Social Psychology, XLIII (April, 1948), 193-200.
- Schachter, S., B. Willerman, L. Festinger, and R. Hyman, "Emotional Disruption and Industrial Productivity," Journal of Applied Psychology, XLV (August, 1961), 201-213.
- Schlosberg, Harold, "Three Dimensions of Emotion," Psychological Review, LXI (January, 1954), 81-88.

Wagner, Allen, "Conditioned Frustration as a Learned Drive," Journal of Experimental Psychology, LXVI (September, 1963), 142-148.

Webb, W. B., "The Motivational Aspects of an Irrelevant Drive in the Behavior of the White Rat," Journal of Experimental Psychology, XXXIX (April, 1949), 1-14.

Wittrock, M. C. and T. R. Husek, "Effect of Anxiety Upon Retention of Verbal Learning," Psychological Bulletin, X (January, 1962), 78.