HIGH TEST ANXIETY AND

THE MOTIVE TO

AVOID FAILURE

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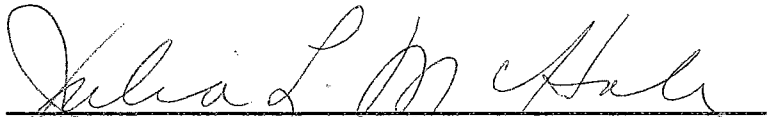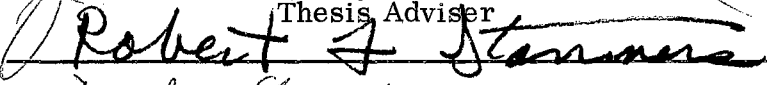
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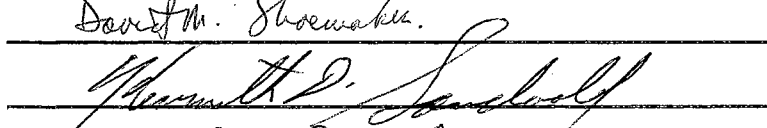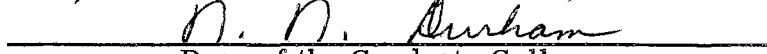# THE MOTIVE TO

AVOID FAILURE

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION AND REVIEW OF THE LITERATURE

General versus Specific Anxiety

In recent years anxiety as a motivational construct in academic perfor-
mance has become extremely important in psychological research. Two diver-
gent views as to the nature of this construct and its function have led to the
development of different instruments to measure anxiety. One position, stem-
ming from Taylor (1953), uses a measure of general anxiety, the Manifest
Anxiety Scale (MAS), as an indicator of an individual's situationally independent,
relatively constant drive state. The other exemplified by Mandler and Sarason
(1952), uses a measure of specific anxiety, the Test Anxiety Questionnaire
(TAQ), as an indicant of drive peculiar to achievement (test) situations.

For the purpose of this study it is unnecessary to present detailed
explanations of the theoretical framework and empirical extensions of either
position. It will suffice to indicate that in a competitive test situation the
theories underlying the development of both the MAS and TAQ would generally
predict that high anxiety debilitates performance.

A comparison of the research concerning the MAS and TAQ seems to
indicate greater validity for the latter in predicting academic performance and
achievement. Schulz and Calvin (1955) report a non-significant correlation
between MAS scores and ACE levels. I. G. Sarason (1956), reports no signifi-
cant relationships in comparing the MAS to the ACE and to grade point averages.
On the other hand I. G. Sarason (1957) reports significant negative correlations

between TAQ scores and both Scholastic Aptitude Test scores ($r = -.14$, $p < .05$) and Mathematical Aptitude Test scores ($r = -.20$, $p < .01$). Correlations between TAQ scores and grade point averages for the first two years of college were also significant (first year: $r = -.14$, $p < .05$; second year: $r = -.17$, $p < .05$). Alpert and Haber (1960) compared the TAQ to a number of general anxiety scales and their relationships to aptitude and academic performance. The MAS was not significantly correlated with the Scholastic Aptitude Test but the correlation between the TAQ and this aptitude test was statistically significant ($r = -.18$, $p < .05$). Moreover, TAQ scores were significantly correlated with grade point averages ($r = -.24$, $p < .05$) while MAS scores were not.

In correlation studies between the TAQ and MAS some commonality is indicated. Raphelson (1957) reports a correlation of .53 ($N = 24$) and Mandler and Cowen (1958) report a correlation of .59 ($N = 35$). The latter authors suggest that these consistent correlations are not high enough to allow substitution of either scale by the other.

This brief survey of the research comparing the predictive power of the TAQ and the MAS is to serve as an introduction to Atkinson's theory of achievement motivation. Atkinson considers anxiety in a test situation as the basis of the construct, "motive to avoid failure". Although he accepts both the TAQ and the MAS as measures of this construct, he prefers the TAQ as the more powerful instrument.

Atkinson's Theory of Achievement Motivation

Atkinson's theory is limited to those situations in which "an individual knows that his performance will be evaluated (by himself or by others) in terms of some standard of excellence and that the consequence of his actions will be either a favorable evaluation (success) or an unfavorable evaluation (failure)"

(Atkinson, 1964, p. 240-241). He posits that performance in these types of situations is a function mainly of the resultant tendency to succeed (T_s) and the tendency to avoid failure (T_{-f}). T_s is a multiplicative function of the motive to achieve success (MS), expectancy of success (P_s) and incentive value of success (I_s) at a specific task ($T_s = MS \times P_s \times I_s$). P_s and I_s are construed as situational variables while MS, measured projectively by specific TAT procedures or the French Test of Insight, is a characteristic of the individual himself. T_{-f} is conceived as a multiplicative function of motive to avoid failure (MAF), expectancy of failure (P_f) and incentive value of failure (I_{-f}) at a specific task ($T_{-f} = MAF \times P_f \times I_{-f}$). P_f and I_{-f} are situational variables while MAF is a characteristic of the person himself.

Atkinson usually employs the TAQ as a measure of motive to avoid failure. He assumes that in achievement - oriented situations the arousal of the motive to avoid failure and the motive to succeed leads to an approach - avoidance conflict which is resolved algebraically in favor of the stronger motive.

Atkinson's handling of anxiety in relation to performance is quite different from Taylor's (MAS) and Sarason and Mandler's (TAQ). Rather than conceiving anxiety as a general drive interacting with dominant habit tendencies as does Taylor, or as a specific drive which helps to elicit task-irrelevant responses as do Mandler and Sarason, Atkinson assumes "... that a disposition to be anxious about failure tends to make all activities in which performance is evaluated threatening to an individual; and actions which might lead to a potential threat are actions to be avoided whenever that is possible." It is thus indicated that a "... person is negatively motivated, or motivated not to perform an act which might have, as a consequence, failure" (Atkinson, 1964, p. 245). The theoretical consequence is that test anxiety inhibits activity that might produce

failure, and thereby, subtracts from T_s ($T_s + T_{-f}$).[1]

Atkinson (1964) endorses specific TAT protocol and the French Test of Insight as measures of the motive to succeed. Both procedures involve the transformation of "... achievement-related imaginative responses ..." into a need for achievement score (n Achievement). Atkinson postulates that the motive to succeed as indicated by n Achievement enhances performance in a test like situation.

An important assumption in Atkinson's theory of achievement motivation is that test anxiety and n Achievement are insignificantly correlated in male college students. Support for this position is found in the Atkinson and Litwin (1960) study in which is reported a Spearman rho of -.15 (N = 47) between n Achievement scores (based upon the French Test of Insight) and test anxiety scores (based upon the TAQ) among male college students. Brody (1963) also reports an insignificant correlation (r = .05) between n Achievement (based upon the TAT) and test anxiety (based upon the TAQ). These results seem to be in contradiction with Raphelson's (1957) investigation in which a significant negative correlation (-.43) between n Achievement and test anxiety was found. The latter finding, however, was obtained while S was under stressful achievement-oriented conditions; Atkinson and Litwin's correlation and Brody's correlation were obtained while S was in a neutral condition, that is, one in which he was not in the midst of an achievement-oriented situation. Atkinson reasons that this

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[1]The logical extension of such a framework is that for very HA Ss (where the motive to avoid failure is greater than the motive to succeed) it would be impossible to take an academic test. Atkinson handles this schema by suggesting that extrinsic motivation, for instance social pressure, would allow HA Ss to enter into a test situation (from Atkinson, 1964).

contrast in conditions precludes the interpretation of these differential results as contradictory. The stressful conditions under which the n Achievement measure was administered in Raphelson's investigation could have inhibited the expression of achievement-related imagery (Atkinson, 1964). The present study is based on the idea that n Achievement and test anxiety are not significantly correlated in male college students.

This basic assumption may at first seem to be in opposition to the TAQ research which tends to indicate that $\underline{S}$s high in test anxiety (HA) differ significantly in performance and achievement from those low in test anxiety (LA; Mandler and Sarason, 1952; Sarason and Mandler, 1952; Sarason et al. , 1952). However, rather than being in contradiction with these results, Atkinson's assumption actually predicts a differential performance between HA and LA Ss:

> If n Achievement and Test Anxiety are uncorrelated,
> a group of persons who score in the top 20 per cent
> on Test Anxiety will have the same average n
> Achievement scores as a group which scores in the
> bottom 20 per cent on Test Anxiety. This means
> that the disposition to be anxious is virtually absent
> in the Low Anxiety group, which is otherwise as
> highly motivated to achieve as the High Anxiety group
> ... Subjects classified High in anxiety are persons in
> whom resultant tendency to approach success is either
> very weak or, what is more likely since only those
> with the highest 20 per cent of anxiety scores are
> normally employed, the resultant tendency is avoidant.

> Atkinson, 1964, p. 250

An important empirical implication that stems from Atkinson's model is that $\underline{S}$s in whom the motive to succeed is greater than the motive to avoid failure (for example, those high in n Achievement but low in test anxiety) should prefer tasks of intermediate difficulty and risk to those that are extremely easy or extremely hard. Likewise, $\underline{S}$s in whom the motive to avoid failure is greater than the motive to succeed (for example, those high in test anxiety but

low in n Achievement) should not prefer tasks of intermediate difficulty and
risk.[2] Using risk taking preference as one of the dependent measures, Atkinson
and Litwin (1960) support the idea that HA $\underline{S}$s have a stronger motive to avoid
failure than do LA $\underline{S}$s. Differentiating HA and LA $\underline{S}$s at the median, they found
that the LA group had a significantly greater perference for intermediate risk
(at a ring toss game) than did the HA group (p<.04). Moreover, the LA group
just missed being significantly more persistent (p<.06) and performing signifi-
cantly better (p<.06) on a final examination than the HA group. Results on a
measure of n Achievement (French Test of Insight) coupled with the TAQ
isolated four experimental groups: High n Achievement-Low Test Anxiety,
High n Achievement-High Test Anxiety, Low n Achievement-Low Test Anxiety,
Low n Achievement-High Test Anxiety. Comparing the two extreme groups, the
High n Achievement-Low Test Anxiety (motive to succeed motive to avoid
failure) and the Low n Achievement-High Test Anxiety (motive to avoid failure
motive to succeed) groups, discrimination on all three dependent measures
improved: $\underline{S}$s in the former condition preferred intermediate risk (p<.025),
were more persistent on the exam (p<.01), and performed better on the exam
(p<.025). The distributions on both the measures of n Achievement and Test
Anxiety were dichotomized at the median for high-low discrimination. And
accordingly, with Atkinson's assumption, if extreme scores (top and bottom
20 per cent) were used with either measure alone, one could expect significant
differences in all response measures.

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[2]These implications are derived from Atkinson's mathematical model.
A task of intermediate difficulty and risk is exemplified by one in which the
probability of success (P_s) is equal to .50. If the motive to succeed is greater
than the motive to avoid failure, the resultant approach tendency ($T_s + T_{-f}$)
will be greatest when the task is of intermediate difficulty (P_s = .50) than when
the task is extremely easy (P_s = .90) or extremely hard ($P_s \cong .10$).

Atkinson et al. (1960) tested the hypothesis that $\underline{S}$s high in n Achievement prefer intermediate risk to $\underline{S}$s low in n Achievement. This hypothesis was based upon an extension of Atkinson's assumption concerning the distribution of test anxiety and n Achievement in male college students. Specifically, $\underline{S}$s high in n Achievement should have a stronger motive to succeed than to avoid failure while those low in n Achievement should have a stronger motive to avoid failure than to succeed. The French Test of Insight was used to assess n Achievement in male college students (sophomore-junior level). $\underline{S}$s high in n Achievement were those who scored above the median of the distribution and $\underline{S}$s low in n Achievement were those who scored below the median. Risk taking preference was measured by the distance from the target from which S chose to shoot during a shuffleboard game. The high n Achievement group took significantly more shots from the intermediate risk zone than the low n Achievement group ($p < .005$). Although the hypothesis was supported further analysis only partially supported the assumptions leading to the hypothesis. The finding that the high n Achievement group took significantly more than a chance number of shots from the intermediate zone ($p < .02$) indicates that this group was dominated by the motive to succeed. The finding that the low n Achievement group did not take significantly less than chance shots from the intermediate range ($p < .25$) does not allow the inference that this group was dominated by the motive to avoid failure.

Another important prediction in Atkinson's theory is that "... a strong motive either to approach or to avoid some goal may bias the subjective probability of the outcome in the direction consistent with the motive" (Atkinson, et al., 1960, p. 33). Atkinson et al. support this prediction. After practice shots with all $\underline{S}$s present, each $\underline{S}$ was asked to estimate how many people he would beat in the shuffleboard game. Despite the fact that there were no significant

differences in performance during practice, the estimates of success of the high n Achievement group were significantly higher than those of the low n Achievement group (p< .02).

Feather (1965) reports results which are supportive of the above prediction. Male college students were given an anagrams test under two different instructional sets, one representing the task as "moderately difficult" and the other as "easy". After the instructions but before work had commenced, S estimated his chances of solving all the anagrams. In both conditions initial estimates of probability of success were significantly negatively related to test anxiety as assessed by the TAQ (in the moderately difficult condition: $r = -.27$, $p < .01$; in the easy condition: $r = -.39$, $p < .005$). Although the higher negative correlation in the easy condition was not expected, the findings do support a prediction based upon the assumption that test anxiety is a measure of motive to avoid failure. The correlation between n Achievement (as assessed by the TAT) and initial probability of success was significant and in the expected direction for Ss in the moderately difficult condition ($r = .20$, $p < .05$). The correlation between n Achievement and estimates of probability of success was non-significant and negative for Ss in the easy condition ($r = -.20$). The magnitudes of both correlations support the prediction.

Watson and Siegel (1967) directly tested Atkinson's hypothesis that Ss high in test anxiety are dominated by motive to avoid failure while those low in test anxiety are dominated by motive to succeed. Using a Canadian form of the TAQ the experimenters isolated extremely HA and extremely LA Ss (top and bottom 15 per cent of the distribution). These groups were tested by a maze sheet which was presented as a predicter of university performance. Differential instructions to the Ss posed the possible outcomes of three different treatment groups as: failure-neutral, neutral-success, and failure-success.

The relevant predictions were (1) that performance of HA Ss in a neutral-success condition would be better than under conditions of failure-success or failure-neutral because motive to avoid failure would not be aroused in the former, and (2) that performance of LA Ss in a neutral-failure condition would be worse than under a neutral-success or failure-success condition because motive to succeed would not be aroused in the former. Using measures of accuracy and effort neither prediction was confirmed.

Summary and Conclusions

As the review of the literature reveals, predictions of risk taking preference and expectations of success based upon differential motivation hold up fairly well when HA Ss are assumed to be dominated by motive to avoid failure and LA Ss by the motive to succeed. Expectations also seem to be fairly well born out when Ss high in n Achievement and low in n Achievement are considered to be dominated by the motive to succeed and the motive to avoid failure respectively.

Perhaps the motives to approach success and avoid failure are best manifested in the effort that S makes during a test. Atkinson and Litwin (1960) report a near significant difference ($p < .06$) on a measure of effort (time spent on final exam) between HA Ss and LA Ss. The greater effort of the LA Ss is impressive considering that the levels of anxiety were based upon a dichotomy at the median of the distribution of scores on the TAQ. Since the multiple choice exam had a three hour limit (much more than necessary), time spent on the test was probably an appropriate expression of effort. In the Watson and Siegel (1967) study extremely HA and extremely LA Ss failed to manifest differential effort. Here effort was considered to be expressed by the number of novel problems that S could complete in a ten minute period. The problems consisted of tracing specific pathways as directed on a "maze sheet ... of

1,160 random two-digit numbers". Considering the novelty of the situation and the level of concentration on detail that was required (as the authors emphasize), it seems tenuous to interpret the speed factor here as a measure of effort. It was one purpose of this study to minimize the possibility of such interfering factors.

Watson and Siegel state that "An adequate test of Atkinson's theory needs more outcome situations than simply failure versus success" (p. 237). The author is in total agreement that the testing of the theory of achievement motivation is facilitated by the presence of a "neutral" outcome, that is, one in which S objectively neither fails nor succeeds. But care must be taken not to distort extensions of the theory. Watson and Siegel base their hypotheses on the idea that the motive to succeed will not be aroused in a situation where success is impossible, and the motive to avoid failure will not be aroused when failure is not a possibility. The first statement would apply to a situation where the possible outcomes are only failure and neutral, and the second where the possible outcomes are success and neutral. As applied to Atkinson's model this reasoning appears to be misleading. In any situation where either motive would be inhibited, so would the other. In a neutral-failure situation, for instance, the probability of success would be zero and therefore the probability of failure technically would be unity. Consequently, because of the multiplicative relationships involved, both the tendency to succeed and the tendency to avoid failure would be zero.[3]

Such a paradox could be handled if success were given another criterion rather than "success" per se. If high test anxious Ss are dominated by the

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[3]The mathematical basis for this reasoning is presented in Chapter II.

motive to avoid failure, then their criterion of success should be "no failure".
Since this criterion is realized by neutral performance, a test of Atkinson's
theory is facilitated by a neutral outcome.

Watson and Siegel's study serves as a point of departure for the present
investigation. However, a neutral outcome is not conceived here as one in which
both failure and success are impossible. Rather it is conceived as the success
criterion of $\underline{S}$s dominated by the motive to avoid failure.

CHAPTER II

STATEMENT OF THE PROBLEM

The present study was concerned with a small segment of Atkinson's theory involving the motivation of HA $\underline{S}$s. A major premise was kept in mind in designing the experiment:

> The main point of what the theory of achievement motivation has to say about the person in whom the disposition to be anxious about failure is stronger than the disposition to achieve success is simply this: his behaviour in achievement-oriented situations is to be understood in terms of what he is trying not to do ... it is more strongly influenced by the tendency to avoid failure by avoiding realistic achievement risks than by the tendency to achieve success.

<div align="right">Atkinson, 1964, p. 261</div>

The following mathematical assumptions of Atkinson concern the interaction of the tendency to succeed (T_s) and the tendency to avoid failure (T_{-f}):

Expectancy of success (P_s) + expectancy of failure (P_f)	$= 1.00$
Incentive value of success (I_s)	$= 1 - P_s$
Negative incentive value of failure (I_{-f})	$= -P_s$
Resultant tendency	$= T_s + T_{-f}$

If a group of high test-anxious male college students were put in an intelligence test situation, and if Atkinson's assumption concerning the distribution of the motives to avoid failure and approach success is correct, the group should be dominated by the former. Since the $\underline{S}$s are college students taking an

intelligence test the individual expectancy of failure, that is, performance in the below average intelligence range, should be minimal in most cases. Therefore, P_f should be very low, for example, .10. From Atkinson's assumption listed above these other values would follow: $P_s = .90; I_s = .10;$ $I_{-f} = -.90$. Make the further supposition that during the test three groups of HA $\underline{S}s$ are differentially cued as to their performance so far. In one group the $\underline{S}s$ are cued that they are performing in the average intelligence range, in another that they are performing above average, and in the final group that their performance is below average. Based upon Atkinson's assumption that HA $\underline{S}s$ are dominated by the motive to avoid failure, assume that the values of the motives to avoid failure and approach success are 2 and 1 respectively for the typical $\underline{S}$ in the group. The hypothetical changes in the resultant tendencies for the three groups are presented in Table I.

TABLE I

RESULTANT TENDENCIES FOR THREE HYPOTHETICAL
GROUPS OF DIFFERENTIALLY CUED HA Ss

	$T_s + T_{-f}$	MS x P_s x I_s			MAF x P_f x I_{-f}		
Beginning of test	-.0900	1	.90	.10	2	.10	-.90
After neutral cues (average intelligence)	-.0900	1	.90	.10	2	.10	-.90
After success cues (above average)	-.0475	1	.95	.05	2	.05	-.95
After failure cues (below average)	-.2500	1	.50	.50	2	.50	-.50

Notice that the resultant tendency changes greatly only in the Failure condition due to the change in the value of P_f.

The hypothesis tested, that HA Ss are dominated by the motive to avoid failure rather than the motive to succeed afforded two predictions which are represented in Table I. These predictions are:

1. In a testing situation where the value of P_f is initially low, there will be a significant increment in the effort of HA Ss to perform better after Failure cues as compared to the effort after Neutral cues.

2. In a testing situation where the value of P_f is initially low, there will be no significant difference in the effort of HA Ss to perform better after Neutral cues as compared to the effort after Success cues.

CHAPTER III

METHOD

Subjects

The Mandler-Sarason TAQ was administered to 300 male students enrolled in the Introductory Psychology classes at Oklahoma State University. The scores ranged from 86 to 296 with a mean of 186.02 and a standard deviation of 35.61. All but two of those who scored in the top 20 per cent (N = 58) were used as $\underline{S}$s. These scores ranged from 215 to 296.

Apparatus

An Anchromatic II 35 mm slide-projector and screen were utilized to present 20 experimental slides. Each slide consisted of a round clock face devoid of numbers and displaying only a minute hand and an hour hand. The clock faces were structured as follows: there were 4 fulcrum positions, the fulcrum indicating the bottom of the clock. Each of the 4 positions appeared on 5 clocks (see Figure 1). Five different hour-minute hand settings were used with each of the 4 fulcrum positions (see Figure 2). Four training slides were also used in the experiment (see Figure 3).

A Grason-Stadler Voice Operated Relay was connected to a timing device accurate to 1/1000 of a minute; a throat microphone specific to the Grason-Stadler completed the equipment.
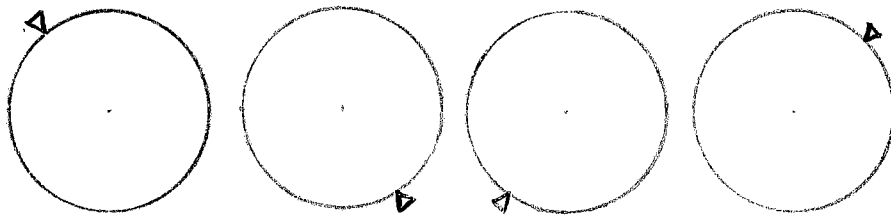
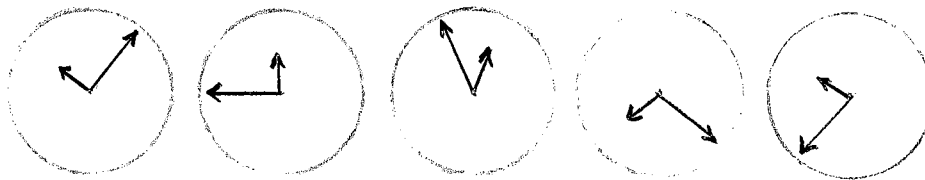Figure 1. Fulcrum Positions

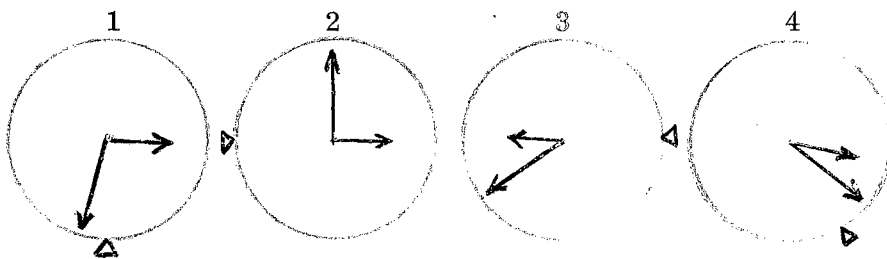Figure 2. Hour-Minute Hand Positions

Figure 3. Training Slides

Materials

The Mandler-Sarason TAQ was utilized to isolate high test-anxious Ss.
The scoring system used was that suggested by Mandler and Cowen, J. E.
(1958): each of the 35 relevant items was divided into 10 intervals and assigned
a value of 1 to 10 in the direction of high anxiety; the raw score for each item
was summed across the 35 questions to obtain the final score.

Procedure

Training session. All Ss were run individually. At the beginning of the
session S, seated in front of a movie screen, was asked to remove his watch.
He then received the following instructions designed to influence him to perceive
the task as one testing intelligence. A false scoring system was also presented
in order to predispose S to interpret specific cues in the desired manner.

Instructions

> This task is a major portion of an intelligence test
> widely used in research with college students. In my
> research I am interested only in those with above
> average and below average intelligence.
>
> On the screen in front of you a sequence of 20 clock
> faces will be projected. The clock faces will be
> bare except for the hour and minute hands; no num-
> bers will be on the clock. Each clock will be a mirror
> image; that is, pretend that we have taken a picture of
> the mirror image of the clock and now I am showing
> you that picture on the screen. More about this
> aspect later ...
>
> Your task is to decide as quickly and as accurately as
> possible the correct time on each clock. When you
> have estimated the correct time (in terms of hours
> and minutes) say your answer loudly and clearly into
> the microphone. Both the speed with which you answer
> and the precision of your answer will be recorded and
> weighted equally to get your intelligence score.
>
> In past instances of the intelligence test it has been

found that the more quickly one performs, the less accurate is the estimate; the converse is also true: the slower you go, the more accurate will be your estimate. This principle has held true in virtually every case.

After you have estimated the correct time on the first clock face, there will be a slight pause; then the second clock will appear and you will do likewise for 20 exposures. After you have finished the first 10 clocks, you will be reminded that you are at the mid-point, that is, that you have completed one half the task.

Although there is no time minimum or maximum on this test, there is a specific amount of time normally used by the person with average intelligence to finish the 20 exposures. When you have used up one half your time (based upon this average count) you will be told so. Of course, if you use up one half your time before the mid point, it means you are doing below average in terms of speed; and if you complete the first 10 clock faces before using up one half your time, it means that you are performing faster than the average person.

Whenever that point comes when one half your time is used up, you will also be told how accurate your estimates have been; if you hear "good" it means you are doing above average in your accuracy score; if you hear "bad" it means you are doing below average in your estimates so far.

I have mentioned before that we are interested only in those below and above average intelligence. Here is how we select. If you do poorly on either speed or accuracy, but well on the other, after 20 clock estimates, your intelligence score will be in the average range. You will not be contacted if this is the case. If you do poorly on both speed and accuracy, you will be contacted, and told your exact score and asked if your score and name may be used in further research. Likewise, if you do well on both speed and accuracy, you will also be contacted, told how high your intelligence score is, and asked if your exact score and name may be used in further research.

Remember, the information you receive during the exam indicates only how well you are doing so far: the situation can change by the end of the 20 clocks.

One more point ... the mirror images of the clocks may be shown rotated upside down, sideways, etc. ...

you will be able to know which is the top and bottom
by the position of the fulcrum under the "6" position.
Make sure you realize that the picture of the mirror
image was taken while the clock was in a normal
upright position. It is the picture that will be rotated.

Now for some examples . . . .

After these instructions were read, S underwent a short training period in

which he was presented with the four practice mirror images. These training

slides were displayed individually and in a graduating degree of difficulty. S

was not allowed to begin the experimental task until he had independently esti-

mated the correct time on slide #4 (see Figure 3).

Experimental session. Previous to entering the training session S had

been randomly placed into one of the four treatment conditions: Failure,

Neutral I, Success, Neutral II. In each condition the twenty clock faces were

presented in random order for each S. S's estimate, in the form of an oral

response, stopped a timing device by way of the voice operated relay; a throat

microphone was used to pick up the cue. E was seated behind a screen manipu-

lating the equipment and recording the time of estimation per clock exposure.

The treatment conditions were as follows:

Failure. After the seventh clock exposure S was signalled as follows:

"You have used up one half your time; your accuracy has been bad." It was

thereby indicated to S that he was doing poorly on both speed and accuracy,

typical of those with below average intelligence.

Neutral I. After the seventh clock exposure S was cued as follows:

"You have used up one half your time; your accuracy has been good." S was

thus informed that he was doing poorly on speed but well on accuracy which

indicated that his performance was as expected for a person with average

intelligence.

Success. After the thirteenth clock exposure S was cued as follows:

"You have used up one half your time; your accuracy has been good." S was thereby signaled that his performance was above average.

Neutral II. After the thirteenth clock exposure S was cued as follows: "You have used up one half your time; your accuracy has been bad." S was thus informed that he was doing well on speed but poorly on accuracy which indicated that his performance was as expected for a person with average intelligence.

In the failure condition S was expected to significantly increase his average time of estimation (to improve his accuracy score) or significantly decrease his time of estimation (to improve his speed score) after the speed-accuracy cues.

In the Neutral I condition S had been signaled that he was meeting his theoretical criterion of "no-failure". If S's motivation had been dominated by the motive to avoid failure and not by the motive to succeed, he should have had little or no drive to approach above average performance. Consequently, there should have been no significant increase in his average speed of estimation after the time-accuracy cues. Since Neutral I was conceived as the base-line for the Failure treatment, a significant difference was expected between the average changes in response times for these two groups.

In the Success treatment no significant increase or decrease in average time of estimation was expected after the speed-accuracy cues. S was performing well above his criterion.

In the Neutral II treatment S had been signaled that he was meeting his criterion of no-failure. If S's motivation had been dominated by the motive to avoid failure and not by the motive to succeed, he should have had little or no drive to approach above average performance. Consequently, there should have been no significant decrease in his average speed of estimation after the time-accuracy cues.

Since the Success condition was considered the baseline for Neutral II,
no significant difference was expected between the average changes in response
times for these two groups.

CHAPTER IV

RESULTS

In the major analyses the Failure-Neutral I pair was considered totally independent from the Success-Neutral II pair because of the differential placement of the time-accuracy cues. For each $\underline{S}$ the essential value was the absolute difference between pre-cue and post-cue average time of estimation per exposure. A one-tailed Mann-Whitney U test was used to test for significance between each pair of treatments. Neither the value for the Failure-Neutral I comparison (U' = 105) nor the value for the Success-Neutral II comparison (U' = 97) was significant at the .05 level (see Table II).

TABLE II

MEANS, VARIANCES AND U VALUES FOR THE ABSOLUTE
DIFFERENCES BETWEEN PRE-CUE AND POST-CUE
AVERAGE TIME OF ESTIMATION
PER EXPOSURE*

	FAILURE	NEUTRAL I	SUCCESS	NEUTRAL II
Mean	.042	.038	.031	.126
Variance	.001	.001	.001	.102
	U' = 105, not significant at .05 level		U' = 97, not significant at .05 level	

*rounded to thousandths of a minute

Because of the extent of individual differences in time per exposure, the data was also analyzed with regard to the rate of change in the average time of estimation:

$$
\begin{array}{c}
\text{rate of change in} \\
\text{average time of} \\
\text{estimation per exposure}
\end{array}
=
\frac{
\begin{array}{c}
\text{absolute difference between} \\
\text{pre-cue and post-cue average} \\
\text{time of estimation per exposure}
\end{array}
}{
\begin{array}{c}
\text{average pre-cue time of} \\
\text{estimation per exposure}
\end{array}
}
$$

A one-tailed Mann-Whitney U test was used to test for significance between each pair of treatments. Neither the value for the Failure-Neutral I pair (U = 111) not the value for the Success-Neutral II pair (U = 80) was significant at the .05 level (see Table III).

TABLE III

MEANS, VARIANCES AND U VALUES FOR THE RATE OF
CHANGE IN AVERAGE TIME OF ESTIMATION
PER EXPOSURE

	FAILURE	NEUTRAL I	SUCCESS	NEUTRAL II
Mean	.254	.227	.190	.291
Variance	.061	.026	.022	.079

U = 111, not significant at .05 level	U = 80, not significant at .05 level

Apart from the magnitudes of the post-cue time changes, the data was also analyzed with respect to direction of change. A one-tailed sign test was used to check for a bias in the direction of change in each Neutral group after the time-accuracy cues. As would be expected from the instructional set, the

number of $\underline{Ss}$ that decreased their post-cue speed in the Neutral I was significantly small ($x = 2$, $p < .004$). Likewise, a significantly small number of $\underline{Ss}$ increased their post-cue speed in the Neutral II condition ($x = 2$, $p < .011$; see Table IV). Sign tests were also used to check for a directional bias in the Failure and Success groups. Since the instructions should not have predisposed $\underline{S}$ to react in any specific direction, two-tailed tests were used. Neither group had a significant bias for either an increment or decrement in speed after the cues (see Table IV).

TABLE IV

SIGN TESTS ON THE DIRECTION OF CHANGE AFTER
CUES FOR ALL TREATMENTS

Treatment	Number of Ss that increased	Number of Ss that decreased	probability levels
Neutral I	13	2	$p < .004$, one-tailed
Neutral II	2	11	$p < .011$, one-tailed
Failure	11	4	$p < .118$, two-tailed
Success	10	5	$p < .302$, two-tailed

CHAPTER V

DISCUSSION

The results of the major analyses do not support the hypothesis that high test anxious $\underline{S}$s are dominated by the motive to avoid failure. Although prediction number (2) was born out that there would be no difference in the effort of HA $\underline{S}$s to perform better after success feedback as compared to the effort after neutral feedback, the failure of prediction number (1) precludes even the slightest support for Atkinson's assumption. These results were consistent employing both the absolute difference between pre-cue and post-cue average time of estimation per exposure and the rate of change in the average time of estimation per exposure in the data analyses.

In terms of Atkinson's constructs a conservative inference would be that HA $\underline{S}$s are not dominated by a motive to avoid failure but possess equally both a motive to succeed and a motive to avoid failure. Consequently, although there was an increase in the effort of the Failure group due to the motive to avoid failure, an increase in the effort of the Neutral I group due to the motive to succeed blunted any sharp difference that should have appeared if HA $\underline{S}$s were dominated by the former motive. Moreover, although the Neutral II group demonstrated a greater increase in effort as compared to the Success group, the motive to succeed was not potent enough to allow statistical significance.

Perhaps these negative results could be attributed to the lengthy instructions. During the training session E often had to clarify some of the

directions for S̲. However, the general performance tends to indicate that the subjects did comprehend the directions. In the Neutral I treatment where S̲ was cued that his speed was below average and his accuracy was above average, any decrease in speed would serve no adaptive function since it could not boost S̲'s intelligence score above the average range; only an increase in speed could facilitate the reaching of above-average performance. In keeping with these directional expectations 13 S̲s in the Neutral I condition speeded up after the cues, while only 2 S̲s slowed down ($p < .004$). Likewise, in the Neutral II treatment where S̲ was cued that his speed was above average and his accuracy below average, only a decrease in speed could have helped S̲ approach above average intelligence. Again only 2 S̲s displayed an increment in speed while 11 S̲s decreased their speed ($p < .011$). Such results do not negate the validity of the design.

Watson and Siegel (1967) in testing the hypothesis that HA S̲s are dominated by the motive to avoid failure and LA S̲s by the motive to succeed, suggest that their negative results could have been a function of an inadequacy of the TAQ as an instrument to measure test anxiety. This idea may have some relevance in view of Gorsuch's (1960) finding that the general factor (called Test Anxiety) in the TAQ is small relative to the variance of the complete test. The latter author recommends that the TAQ be revised.

It is interesting to note here that the TAQ had been developed from the theoretical position that anxiety interferes with task completion (Mandler and Sarason, 1952; Sarason, Mandler and Craighill, 1952). Yet, Atkinson employs the TAQ as a measure of a construct (motive to avoid failure) which inhibits activity that might produce failure. It may be argued that the results of the present study were a function of this theoretical discrepancy.

CHAPTER VI

SUMMARY

This study attempted to test an extension of Atkinson's theory of achievement motivation, namely, that high test anxious $\underline{S}$s are dominated by the motive to avoid failure. Two predictions were put forth: (1) In a testing situation where the value of P_f is initially low, there would be a significant increment in the effort of HA $\underline{S}$s to perform better after Failure cues as compared to the effort after Neutral cues. (2) In a testing situation where the value of P_f is initially low, there would be no difference in the effort of HA $\underline{S}$s to perform better after Success cues as compared to the effort after Neutral cues.

HA $\underline{S}$s were isolated using the TAQ as a measure of test anxiety. From a sample of 300 male undergraduates 58 $\underline{S}$s from the top 20 per cent of the distribution were used in the experiment. $\underline{S}$s were individually presented with a false intelligence test requiring them to estimate the correct time on each of 20 slides bearing a clock face. The clock faces were bare except for a minute hand and an hour hand, and were presented as "mirror images".

Instructions were designed so as to predispose $\underline{S}$ to interpret certain feedback concerning his performance as indicative of average, below average, or above average intelligence. Measures of effort were based upon a speed change after the cues.

Although prediction (2) was born out, the failure of prediction (1) precluded the interpretation of the results as supportive of the hypothesis. It was

concluded that high test anxious $\underline{S}$s are dominated by neither the motive to

succeed nor the motive to avoid failure.

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APPENDIX A

DIFFERENCES AND RATES OF CHANGE BETWEEN

PRE-CUE AND POST-CUE AVERAGE

TIME OF ESTIMATION PER

EXPOSURE PER

SUBJECT

Failure (n = 15)			Neutral I (n = 15)			Success (n = 15)			Neutral II (n = 13)		
S	Difference*	Rate	S	Difference	Rate	S	Difference	Rate	S	Difference	Rate
BK	-.018	.033	RH	+.122	.634	TD	-.033	.120	PA	+.095	.777
SB	-.015	.090	RB	-.014	.075	BK	-.017	.204	JH	-.013	.055
TB	+.112	1.032	FW	-.084	.404	WR	+.006	.034	RG	+.076	.358
TD	-.065	.398	JR	-.013	.158	RM	-.021	.170	GH	+.004	.054
JC	-.109	.285	JS	-.028	.294	RC	-.023	.190	AB	+.006	.073
BF	+.038	.385	JB	-.022	.227	DM	+.032	.191	DH	+.020	.219
RJ	-.030	.319	JH	-.011	.098	LP	-.015	.144	SK	+.070	.579
RJ	-.051	.313	CB	-.007	.072	BM	-.007	.039	GB	+.008	.062
JT	+.025	.113	RH	-.013	.113	RC	+.062	.316	RL	+.010	.050
TT	-.017	.153	JO	+.049	.247	JG	+.013	.049	GM	+1.180	.598
DB	-.108	.254	VS	-.041	.173	WB	-.053	.365	JL	+.019	.200
RB	-.010	.165	JB	-.067	.350	RC	-.020	.180	JC	-.004	.031
GB	-.003	.045	JC	-.002	.015	HP	-.001	.011	FH	+.131	.720
JE	-.011	.087	HC	-.063	.349	SL	+.131	.571			
JF	+.022	.145	S	-.027	.193	JS	-.036	.270			

*Differences rounded to thousandths of a minute

APPENDIX B

TEST ANXIETY QUESTIONNAIRE

Questionnaire on Attitudes Toward Three Kinds of Testing Situations
(College Form)

Name: _____
(Please Print)

This questionnaire is designed to give you an opportunity to indicate how and what you feel in regard to three types of testing situations:
a) the group intelligence or aptitude test, such as those you took upon entrance to college,
b) the course examination,
c) the individual (face-to-face) type of intelligence test.
One of the main reasons for constructing this questionnaire is the fact that very little is known about peoples' feelings toward the taking of various kinds of tests. We can assume that people differ in the degree to which they are affected by the fact that they are going to take a test or by the fact that they have taken a test. What we are particularly interested in here is how widely people differ in their opinions of and reactions to the various kinds of testing situations.

The value of this questionnaire will in large part depend on how frank you are in stating your opinions, feelings and attitudes: Needless to say, your answers to the questions will be kept strictly confidential; they will under no circumstances be known to any instructor or official of the University.

We are requesting you to give your name, class, etc., only because it may be necessary for research purposes.

Each of you has taken a course examination and a group intelligence or aptitude test, but not all of you have taken an individual intelligence test. Those of you who have not taken such a test are requested to answer the relevant questions in terms of how you think you would react to them. We want to know what you think your attitudes and feelings toward such a test would be and not what you think they ought to be. Those who have taken an individual intelligence test will, of course, answer the questions in terms of what they actually experienced.

For each question there is a line or scale on the ends of which are statements of opposing feelings or attitudes. In the middle of the line you will find either the word "Midpoint" or a phrase, both of which are intended to reflect a feeling or attitude which is in-between the statements of opposing feelings described above. You are required to put a mark (X) on that point on the line which you think best indicates the strength of your feeling or attitude about the particular question. The midpoint is only for your guidance. Do not hesitate to put a mark on any point on the line as long as that mark reflects the strength of your feeling or attitude.

If you have any questions at this time, please ask the person who has passed out the examinations.

THERE ARE NO "CATCH" QUESTIONS IN THIS QUESTIONNAIRE. PLEASE READ EACH QUESTION AND EACH SCALE VERY CAREFULLY. THERE IS NO TIME LIMIT.

SECTION I.

The following questions relate to your attitude toward and experience with group intelligence or aptitude tests. By group intelligence tests we refer to tests which are administered to several individuals at a time. These tests contain different types of items and are usually paper and pencil tests with answers requiring either fill-ins or choice of several possible answers. Scores on these tests are given with reference to the standing of the individual within the group tested or within specific age and educational norms. The College Entrance Board tests which you have taken represent this type of test. Please try to remember how you usually reacted toward these tests and how you felt while taking them.

THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

1. How valuable do you think group intelligence tests are in determining a person's ability?

| Very valuable | Valuable in some respects and valueless in others | Valueless |

2. Do you think that group intelligence tests should be used more widely than at present to classify students?

| Should be used less widely | Should be used as at present | Should be used more widely |

3. Would you be willing to stake your continuance in college on the outcome of a group intelligence test which has previously predicted success in a highly reliable fashion?

| Very willing | Uncertain | Not willing |

4. If you know that you are going to take a group intelligence test, how do you feel beforehand?

| Feel very unconfident | Midpoint | Feel very confident |

5. After you have taken a group intelligence test, how confident do you feel that you have done your best?

| Feel very unconfident | Midpoint | Feel very confident |

THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

6. When you are taking a group intelligence test, to what extent do your emotional feelings interfere with or lower your performance?

Do not interfere at all	Midpoint	Interfere a great deal

7. <u>Before</u> taking a group intelligence test, to what extent are you aware of an uneasy feeling?

Am very much aware of it	Midpoint	Am not aware of it at all

8. <u>While</u> taking a group intelligence test to what extent do you experience an accelerated heartbeat?

Heartbeat does not accelerate at all	Midpoint	Heartbeat noticeably accelerated

9. <u>Before</u> taking a group intelligence test to what extent do you experience an accelerated heartbeat?

Heartbeat does not accelerate at all	Midpoint	Heartbeat noticeably accelerated

10. <u>While</u> taking a group intelligence test to what extent do you worry?

Worry a lot	Midpoint	Worry not at all

11. <u>Before</u> taking a group intelligence test to what extent do you worry?

Worry a lot	Midpoint	Worry not at all

12. <u>While</u> taking a group intelligence test to what extent do you perspire?

Perspire not at all	Midpoint	Perspire a lot

13. <u>Before</u> taking a group intelligence test to what extent do you perspire?

Perspire not at all	Midpoint	Perspire a lot

THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

14. In comparison with other students how often do you think of ways to avoid a group intelligence test?

Less often than other students	Midpoint	More often than other students

15. To what extent do you feel that your performance on the college entrance tests was affected by your emotional feelings at the time?

Affected a great deal	Midpoint	Not affected at all

THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

18

20. <u>After</u> you have taken an individual intelligence test, how confident do you feel (or expect that you would feel) that you have done your best?

| Would feel very unconfident | Midpoint | Would feel very confident |

21. <u>Before</u> taking an individual intelligence test, to what extent are you (or would you be) aware of an "uneasy" feeling?

| Am not aware of it at all | Midpoint | Am very much aware of it |

22. <u>While</u> taking an individual intelligence test to what extent do you (would you) experience an accelerated heartbeat?

| Heartbeat does not accelerate at all | Midpoint | Heartbeat noticeably accelerated |

23. <u>Before</u> taking an individual intelligence test to what extent do you (would you) experience an accelerated heartbeat?

| Heartbeat does not accelerate at all | Midpoint | Heartbeat noticeably accelerated |

24. <u>While</u> taking an individual intelligence test to what extent do you (would you) worry?

| Worry a lot | Midpoint | Worry not at all |

25. <u>Before</u> taking an individual intelligence test to what extent do you (would you) worry?

| Worry a lot | Midpoint | Worry not at all |

26. <u>While</u> taking an individual intelligence test to what extent do you (would you) perspire?

| Would never perspire | Midpoint | Would perspire a lot |

THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

27. <u>Before</u> taking an individual intelligence test to what extent do you (would you) perspire?

Would never perspire	Midpoint	Would perspire a lot

28. In comparison to other students, how often do you (would you) think of ways of avoiding taking an individual intelligence test?

More often than other students	Midpoint	Less often than other students

THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

SECTION III.

The following questions relate to your attitude toward and experience with course examinations. We refer to major examinations, such as mid-term and finals, in all courses, not specifically in any one course. Try to represent your usual feelings and attitudes toward these examinations in general, not toward any specific examination you have taken. We realize that the comparative ease or difficulty of a particular course and your attitude toward the subject matter of the course may influence your attitude toward the examinations; however, we would like you to try to express your feelings toward course examinations generally. Remember that your answers to these questions will not be available, at any time, to any of your instructors or to any official of the University.

THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

29. Before taking a course examination, to what extent are you aware of an "uneasy" feeling?

Am not aware of it at all	Midpoint	Am very much aware of it

30. When you are taking a course examination, to what extent do you feel that your emotional reactions interfere with or lower your performance?

Do not interfere with it at all	Midpoint	Interfere a great deal

31. If you know that you are going to take a course examination, how do you feel beforehand?

Feel very unconfident	Midpoint	Feel very confident

32. After you have taken a course examination, how confident do you feel that you have done your best?

Feel very unconfident	Midpoint	Feel very confident

THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

33. While taking a course examination, to what extent do you experience an accelerated heartbeat?

Heartbeat does not accelerate at all	Midpoint	Heartbeat noticeably accelerated

34. Before taking a course examination, to what extent do you experience an accelerated heartbeat?

Heartbeat does not accelerate at all	Midpoint	Heartbeat noticeably accelerated

35. While taking a course examination, to what extent do you worry?

Worry a lot	Midpoint	Worry not at all

36. Before taking a course examination to what extent do you worry?

Worry a lot	Midpoint	Worry not at all

37. While taking a course examination, to what extent do you perspire?

Never perspire	Midpoint	Perspire a lot

38. Before taking a course examination, to what extent do you perspire?

Never perspire	Midpoint	Perspire a lot

39. When, in your opinion, you feel well prepared for a course examination, how do you usually feel just before the examination?

Confident	Midpoint	Anxious

THE MIDPOINT IS ONLY FOR YOUR GUIDANCE. DO NOT HESITATE TO PUT A MARK (X) ON ANY POINT ON THE LINE AS LONG AS THAT MARK REFLECTS THE STRENGTH OF YOUR FEELING OR ATTITUDE.

APPENDIX C

SCORE SHEET

NAME: GROUP:

Exposure:

1 _____   14 _____

2 _____   15 _____

3 _____   16 _____

4 _____   17 _____

5 _____   18 _____

6 _____   19 _____
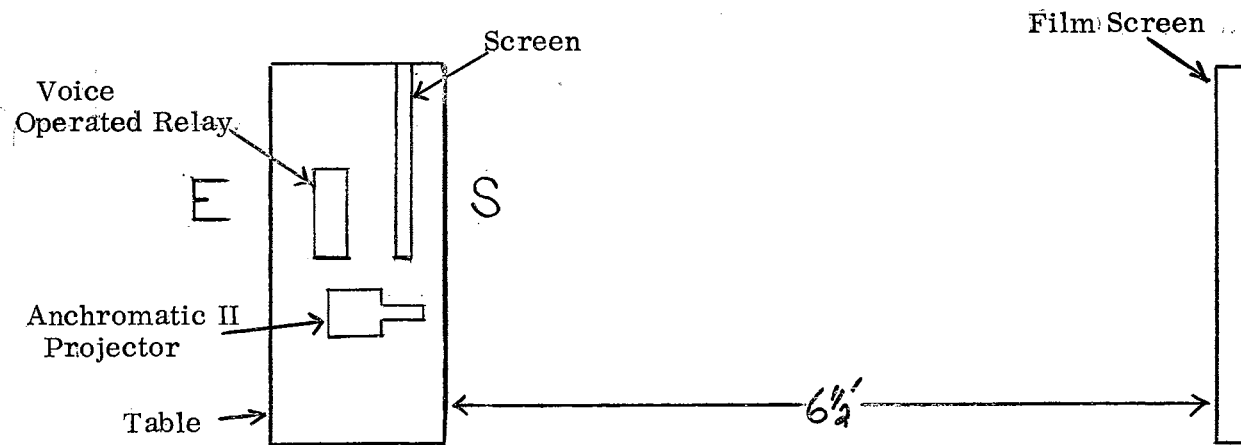
7 _____   20 _____

8 _____

9 _____

10 _____

11 _____

12 _____

13 _____

APPENDIX D

EXPERIMENTAL SET-UP

Voice
Operated Relay

Screen

Film Screen

E

S

Anchromatic II
Projector

Table

6½'

46

VITA

Michael Raymond Quattrocchi

Candidate for the Degree of

Master of Science

Thesis: HIGH TEST ANXIETY AND THE MOTIVE TO AVOID FAILURE

Major Field: Psychology

Biographical:

    Personal Data: Born in New York City, New York, June 21, 1943, the son of Angelo and Catherine Quattrocchi.

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