

ACHIEVEMENT MOTIVATION AND ITEM RECALL  
ON OBJECTIVE EXAMINATIONS

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## CHAPTER I

### THE NATURE OF THE PROBLEM

#### Introduction

Subjects considered to be high in achievement motivation have been shown to exhibit a Zeigarnik Effect in achievement-oriented situations. Generally, these individuals tend to recall more incompleted (failed) than completed (successful) tasks. Conversely, subjects low in achievement motivation have exhibited a tendency to recall more completed than incompleted tasks (Atkinson, 1953; Green, 1963; and Weiner, 1966). Traditionally, the Zeigarnik Effect has been attributed to differential decay rates of the memory traces of incompleted and completed events. Recent analyses suggest that this effect can result from differential learning rather than differential memory (Weiner, 1966; Caron and Wallach, 1957). These analysts believe that motivation can be categorized along a high to low achievement continuum.

One application of this approach indicates that subjects high in achievement motivation learn incompleted tasks to a greater extent than completed tasks in achievement situations. Differential rehearsal would facilitate this process. Thus, subjects high in achievement motivation tend to repeat the incompleted tasks more than the completed tasks, because such overt or covert repetition has been instrumental to problem-solving in the history of the individual. For subjects low in achievement motivation the reverse is true. While the motivation to approach



success has been characterized as a capacity for reacting with pride and accomplishment, the motivation to avoid failure has been regarded as a capacity for reacting with shame and embarrassment when the performance outcome is failure. Whenever it is clear to a person that his performance will be evaluated and failure is a distinct possibility, the motive to avoid failure is aroused within the person. This results in anxiety and an accompanying tendency to withdraw from the situation. Therefore, individuals who become anxious in achievement oriented situations would be expected to avoid the incompleting or failed tasks and repeat the succeeded tasks (Atkinson, 1964).

#### Purpose of the Study

The first purpose of this study was to establish the Zeigarnik Effect among subjects who are exposed to an objective examination which can be used to influence their professional careers. A second purpose was to determine whether or not individuals who are high and low in achievement motivation recall different percentages of incompleting (failed) and completed (successful) items after the examination. Third, the effect upon completed-incompleting item percentage recall after interrupting the examination itself was determined. The final purpose of this study was to demonstrate the difference between the percentage of completed and incompleting items recalled under conditions allowing either unlimited or controlled access to the examination question.

#### Need for the Study

Considerable attention has been devoted to the study of achievement motivation. Theoretical advancements and the accumulation of empirical knowledge in this area now make it possible to apply the accumulated

information to some classroom problems and situations. With the exception of a study by Jager (1959) establishing the Zeigarnik Effect among subjects exposed to an actual examination situation but which omitted the motivation variable, little has been done to relate personality factors to the Zeigarnik Effect in any type of examination setting.

More specifically, maladaptive or inefficient behavior such as approaching certain types of examination questions could be predicted from modifications of Atkinson's 1957 model (Weiner, 1965). This model indicates that when the motivation to approach success is greater than the motivation to avoid failure, greater retention of the incompleting items will result. Conversely, when the motivation to avoid failure is greater than the motivation to approach success there will be greater retention of the completed items. A finding of this nature would demonstrate that subjects high in achievement motivation attempt to solve incompleting items more than subjects low in resultant achievement motivation, a factor which could partially account for differential examination performance.

The present investigation attempts to go beyond the study of Jager by determining the relationship between the Zeigarnik Effect in an actual examination situation and the variables of achievement motivation with the purpose of attempting to understand more fully the personality characteristics which make for efficient examination performance.

#### Limitations of the Present Investigation

This study is limited to first semester freshmen males enrolled in Introductory Psychology 1113 at Oklahoma State University. Although it is recognized that randomized sample selection is desirable, the number of participating subjects and available time made this procedure

impractical. Secondly, volunteers, rather than randomly related individuals were utilized as subjects, since it is extremely difficult to have all instructors teaching introductory psychology classes make experimental participation a required part of their course. There were no other limitations to the present investigation.

#### Definition of Terms

1. The Zeigarnik Effect: For the purposes of this study, the Zeigarnik Effect was defined as the difference between the number of Professional Success Test items which each subject thought he answered incorrectly (IR) and the number of items he thought he answers correctly (CR) divided by the total number of test items completed.

2. The Motive to Approach Success (Ms): This variable was operationally defined as a high standard score (normalized T score falling within the upper 1/3 of the sample distribution) obtained by independently averaging the outcomes of the Dominance (Do), Capacity for Status (Cs), Sociability (Sy), Social Presence (Sp), and Self-acceptance (Sa) scales from the California Psychological Inventory (CPI). Carney, 1966)

3. Mixed Motivation (M): This was the medium standard score (normalized T score falling in the middle 1/3 of the sample distribution) obtained by independently averaging the outcomes of the Dominance (Do), Capacity for Status (Cs), Sociability (Sy), Social Presence (Sp), and Self-acceptance (Sa) scales from the California Psychological Inventory. (Carney, 1966)

4. The Motive to Avoid Failure (Maf): A low standard score (normalized T score falling in the lower 1/3 of the sample distribution) obtained by averaging the Dominance (Do), Capacity for Status (Cs), Sociability (Sy), Social Presence (Sp), and Self-acceptance (Sa) scales

of the CPI was interpreted by this study to mean the motive to avoid failure. (Carney, 1966)

5. Uncontrolled Test: This was a multiple-choice synonym test on which each subject marked the appropriate choice on an answer sheet after being allowed to read each item an unlimited and undesignated number of times.

6. Controlled Test: A multiple-choice synonym test on which the subject marked the appropriate choice on an answer sheet after being allowed to read each test item only once.

7. Completed Task: This was either a Controlled Test or an Uncontrolled Test which the subject believed he had completed.

8. Interrupted Task: Either a Controlled or an Uncontrolled Test on which the subject believed he had been interrupted.

9. The Irrelevant Task: A sentence completion test which subjects in the interrupted groups believed was not related to the immediate experiment, and which they were asked to attempt after being interrupted during the synonym test administration.

10. High Intelligence: Any American College Test score (ACT) shown by college records to fall above the sixty-sixth percentile of the distribution for all subjects participating in the experiment was classified as high intelligence.

11. Medium Intelligence: This was any ACT score shown by college records to fall between the thirty-third and sixty-sixth percentiles of the distribution for all subjects participating in the experiment.

12. Low Intelligence: Any individual whose college record showed an ACT score which fell below the thirty-third percentile of the distribution for all subjects participating in the experiment was placed in this category.

13. High Reading Comprehension: Any Comprehension score from the Nelson-Denny Reading Test shown by college records to fall above the sixty-sixth percentile of the distribution for all subjects participating in the experiment was considered high reading comprehension.

14. Medium Reading Comprehension: A comprehension score on the Nelson-Denny Reading Test shown by college records to fall between the thirty-third and sixty-sixth percentiles of the distribution for all experimental participants was placed in this category.

15. Low Reading Comprehension: This was defined as any Comprehension score from the Nelson-Denny Reading Test shown by college records to fall below the thirty-third percentile of the distribution for all experimental participants.

16. Recall of Completed Items: The percentage of items from the synonym test which each subject believed he completed successfully and which he listed after the administration of irrelevant task.

17. Recall of Incompleted Items: The percentage of items from the synonym test which each subject believed he failed and which he listed after the administration of the irrelevant task.

18. Incompleted (failed) Item: Any item on the synonym test which a subject believed he answered incorrectly.

19. Completed (successful) Item: Any synonym test item which a subject believed he answered correctly.

#### Hypotheses

It was the purpose of this study to determine the extent to which achievement motivation was related to the Ziegarnik Effect among subjects exposed to various conditions of item access and interruption in an objective examination situation. To fulfill this purpose, it was

necessary to obtain an index of achievement motivation and an index of examination performance. The scores from the Dominance, Capacity for Status, Sociability, Social Presence, and Self-acceptance scales of the California Psychological Inventory were averaged and used as an indicator of achievement motivation. The Zeigarnik Effect was represented as the difference between items completed (passed) and items not completed (failed) after the administration of a multiple-choice type synonym test on which experimental groups were either interrupted or prevented from returning to previously attempted questions. To control for differential intelligence and reading performance, item recall in each of the experimental situations was compared with performance on the American College Test (ACT) and the Nelson-Denny Reading Comprehension Scale.

The following hypotheses were examined for the purpose of this study:

1. There is no significant difference between high and low achievement motivation and the differential recall of incompleted and completed items after an interrupted objective examination.

2. There is no significant degree of relationship between high and low achievement motivation and incompleted-completed item recall after an objective examination which provides limited access to previously attempted questions.

3. There is no significant degree of relationship between incompleted-completed item recall after an objective examination and scores on either the American College Test or the Comprehension Scale of the Nelson-Denny Reading Test.

### Preview of the Remainder of the Study

In Chapter II, selected portions of the literature pertaining to the problem are reviewed. Chapter III consists of a description of both subjects and materials utilized in the study. The experimental procedure, experimental variables, dependent measure, and statistical analysis are discussed in Chapter IV. Conclusions, summary and recommendations appear in Chapter V.

## CHAPTER II

### BACKGROUND FOR THE PRESENT STUDY

#### Introduction

Numerous studies have been made which relate the need for achievement with various aspects of human behavior. The present survey of literature, however, does not include references to all the experiments conducted on achievement motivation. This review is concerned only with those studies in which some attempt has been made to relate Atkinson's 1957 model of motivation to the Zeigarnik Effect and, more specifically, to the objective examination situation.

#### Models of Achievement Motivation

##### Atkinson's 1957 Model

Atkinson (1957) postulated that achievement-oriented behavior was the result of situations involving approach-avoidance conflict. It was theorized that individuals attempt to move toward achievement-related activities when the tendency to approach success is greater than the tendency to avoid failure. In turn, individuals will not choose achievement tasks when the tendency to avoid failure is greater than the tendency to approach success. In situations of the latter nature, achievement behaviors are instigated only if other motivations or incentives, extrinsic to achievement, such as money or affiliative opportunities are introduced. Hence, the strength of any approach-avoidance tendency can



in part be determined by differences in an individual's motive to approach success ( $M_s$ ) and his motive to avoid failure ( $M_{af}$ ). The  $M_s$  can be regarded as the person's need for achievement or n Ach. The motive to avoid failure can, conversely, be represented as a disposition to become anxious in achievement-oriented situations. Another aspect of the approach-avoidance tendency strength can be attributed to environmental determinants. These include the incentive value of success ( $I_s$ ), the incentive value of failure ( $I_f$ ), the probability of succeeding at an activity ( $P_s$ ), and the probability of failing at the particular activity ( $P_f$ ). Because more pride is usually experienced in conjunction with successfully completing a difficult task and less pride accompanies success at an easy task,  $I_s$  was conceptualized as  $1 - P_s$ . The conceptualization  $1 - P_f$  was used to illustrate the idea that more shame is experienced when failing at an easy task and less shame ensues with difficult task failure. A further assumption was that  $P_s + P_f = 1$ . Thus, values such as  $P_s + I_s$  and  $P_f + I_f$  are also both equal to 1. Finally, the various aspects of achievement-oriented behavior can be combined to determine the strength of the tendency to undertake a particular activity ( $T_a$ ) by utilizing the following model:

$$T_a = M_s \times P_s \times I_s - (M_{af} \times P_f \times I_f)$$

According to this model,  $T_a$  is positive when  $M_s > M_{af}$ . A negative  $T_a$  results when  $M_{af} > M_s$ .

Empirical support for the model was provided by a number of investigations. Weiner and Rosenbaum (1965), for example, gave subjects, who were classified according to their resultant achievement motivation, 21 trials during which they could either attempt achievement oriented or non-achievement oriented puzzle tasks. By varying the percentage of soluble puzzles, three reinforcement conditions were created (i.e.,

success, intermediate, and failure conditions). Results indicated that all motive groups chose more puzzles as the percentage of reinforced trials ( $P_s$ ) increased. However, subjects classified as high in resultant achievement motivation chose significantly more puzzles than subjects classified as low in resultant achievement motivation when the percentage of success approached .50. Thus, subjects considered to be high in achievement motivation ( $M_s > M_{af}$ ) were more likely to voluntarily undertake achievement activities than subjects low in achievement motivation ( $M_{af} > M_s$ ).

French and Thomas (1958) found that subjects high in achievement motivation persisted longer at insoluble puzzle tasks than subjects low in achievement motivation. These experimenters hypothesized that achievement motivation was related to problem solving effectiveness and to the length of time the subjects worked on a problem without knowledge of results when the problem was related to achievement goals. After learning all the facts necessary for solution, individuals high and low in achievement motivation were allowed up to 35 minutes to determine which electrical switches operated individual lights mounted on a separate panel. It was found that subjects with high achievement motivation were more likely to reach a solution than those with low achievement motivation. High scorers also worked longer than low scorers.

A study of risk-preference (McClelland, 1958) provided additional empirical support for the model. The subjects of this experiment were asked to toss a ring at a peg after being allowed to stand at whatever distance they chose, in an attempt to see whether or not a willingness to take risks was associated with a measure of achievement motive strength in very young children. The results showed that those children presumed to be strong in achievement motivation attempted more shots

at intermediate distances from the peg than children weak in achievement motivation. Thus, subjects in whom  $M_S > M_{af}$  were most attracted to tasks of intermediate difficulty ( $P_S = .50$ ). Individuals in whom  $M_{af} > M_S$  were most attracted to either very easy or very difficult tasks, since failure could be avoided in one (easy tasks) or anticipated in the other (difficult task). Similar results were obtained by Atkinson and Litwin (1960), Mahone (1960), Moulton (1965), Weiner (1965). Thus, the model was given empirical justification for specifying that subjects in whom  $M_S > M_{af}$  are most attracted to tasks of intermediate difficulty ( $P_S = .50$ ) while subjects in whom  $M_{af} > M_S$  are most attracted to tasks which are very easy or very difficult.

#### The 1964 Revision

A second elaboration of the theory attempted to establish the construct of inertial tendencies. This concept incorporated the effect of previously aroused but unsatisfied behaviors, into the theory. It was introduced by Atkinson, (1964) and elaborated by Atkinson and Cartwright (1964). The elaboration asserted that, once aroused, goal-directed tendencies would persist until the goal was attained. Thus, a functional relationship was thought to exist between the strength of any immediate tendency to act and the strength of previously aroused but unsatisfied motives which the organism combined with the strength of any tendency aroused by the immediate stimulus situation. These ideas were formalized and incorporated in the following manner:

$$T_a = (M_S \times P_S \times I_S + TG) + (M_{af} \times P_f \times -I_f)$$

Here, the inertial motivational component was represented by TG. Thus, the Atkinson - Cartwright revision of the achievement model assumed that a goal directed tendency persisted until the goal was attained.

The implications of this assumption have been demonstrated by

Feather (1961). This investigation attempted to examine the relationship of persistence at a task to both its apparent difficulty and to the relative strength within an individual of the motives to achieve success and to avoid failure. The subjects were asked to perform a task which was presented to them individually and represented as part of an unimportant test. Because the task was insoluble, repeated failure ( $P_s = .30$ ) was encountered. In a second experimental condition, the subjects were allowed to succeed continually at the task ( $P_s = .70$ ). The subject was allowed to turn to an alternative task whenever he desired. Persistence was measured by the total time the subject worked at the task before turning to the alternative. Results showed that when  $M_s > M_{af}$  persistence at the initial achievement task was greater when initial subjective probability of success was high (i.e.,  $P_s = .50$ ) than when initial  $P_s$  was low (i.e.,  $P_s < .50$ ). Persistence at the initial achievement task was found to be greater for individuals whose motive to avoid failure was greater than the motive to approach success when the initial  $P_s$  was low (i.e.,  $P_s < .50$ ).

#### Weiner's 1965 Revision

Weiner (1965) objected to the Atkinson-Cartwright conception because it implied that all individuals exhibited an increased tendency to manifest achievement-oriented behavior following failure. This contradicted empirical evidence which indicated an interaction between the effects of success and failure on subsequent performance and individual differences in achievement motivation. Generally this interaction was interpreted to mean that individuals high in achievement motivation exhibited performance increments following failure and decrements following experienced success. On the other hand, individuals low in achievement motivation suffered decrements following experienced failure and

increments following success. To overcome some of the inconsistencies between the success-failure study data and the theory, Weiner re-conceptualized the 1964 model in the following manner:

$$T_a = M_s \times P_s \times I_s - (M_{af} \times P_f \times I_f) + T_G$$

Here,  $T_G$  still represented the persisting tendency to approach or avoid the goal. It was, however, also conceptualized as a resultant force consisting of both the tendency to approach success and the tendency to avoid failure. The application of this revision of the original model indicated that greater approach than avoidance motivation persisted following failure among subjects in whom  $M_a > M_{af}$ . Performance increments would be anticipated for these individuals following failure while performance decrements would be anticipated after success. In turn, individuals in whom  $M_{af} > M_s$  would be expected to exhibit decrements in the level of their performance following failure and increments following success. The revised model implied that individuals who were motivated to avoid failure (highly anxious) would react with discouragement after experiencing failure. On the other hand, they would be encouraged by success. Conversely, motivation would be high after failure, but low after success, for individuals ranking high in achievement motivation.

From this revision of the model, it was possible to predict that subjects high in achievement motivation would experience the greatest motivation to act when attempting a task of intermediate difficulty after experiencing failure. Repeated success prior to the presentation of a task perceived as easy would be expected to result in the lowest performance for individuals in this category. The highest motivation for individuals low in achievement motivation would be expected to occur when either a very easy or a very difficult task was attempted after initially experiencing success. This group would be most inhibited after

experiencing failure prior to being subject to a task which had a 50% probability of success.

These predictions were consistent with the previously cited results obtained by Weiner and Rosenbaum (1965). To obtain empirical support for the revised model, Weiner (1965b) asked 128 college students classified as either high or low in resultant achievement motivation to perform achievement related tasks with the knowledge that they would move on whenever they desired. These initial tasks were performed under conditions of repeated success ( $P_s = .70$ ) and repeated failure ( $P_s = .30$ ). It was found that subjects high in resultant achievement motivation persisted longer and worked with greater speed following failure than following success. Individuals low in resultant achievement motivation persisted longer and worked with greater speed following continual success than continual failure. Thus, Weiner's revision of Atkinson's 1957 Achievement Motivation Model attained empirical support.

A second study by Weiner (1966a) provided additional validity for the model. The subjects participating in this experiment were asked to learn either an easy or a difficult list of paired associates. False norms on the easy task implied that the subjects were doing poorly relative to others. False norms were also utilized to inform the subjects attempting the difficult task that they were doing well relative to others. Subjects high in achievement motivation were found to perform better than subjects low in achievement motivation on the easy task in which failure was experienced. Their performance was worse, however, on the difficult task in which success was experienced. The finding that differential reactions will be exhibited by individuals high ( $M_s > M_{af}$ ) or low ( $M_{af} > M_s$ ) in resultant achievement motivation strongly suggested that both the tendency to approach success and the tendency to avoid failure

persist following nonattainment of a goal.

#### Arousal and Measurement of the Achievement Motive

The basic attempts to arouse and measure achievement motivation have generally involved two propositions. The first holds that motivation exerts an effect on fantasy, and this position originates in the area of projective measurement (Murray, 1938). The second proposition makes the point that motives can be aroused and varied in degree by the conditions of the environment (McClelland et al., 1953). In addition to fantasy, some attempts have also been made to study the effect of arousal on perception. This part of the review will be primarily concerned with fantasy, i.e., Thematic Apperception, measures and only those perceptual instruments which can be directly applied to the present study.

#### Projective Methods

Hunger, rather than learned motive, was the subject of early attempts by Atkinson and McClelland (1948) to establish fantasy as a means of determining the degree of a generally recognized and accepted motive. These investigators asked United States Navy personnel to respond to six hunger-related pictures by writing stories organized around several standard questions such as "What is happening? Who are the persons? What has led up to this situation? What is being thought? What is wanted? By whom? What will happen? What will be done?" Pictures thought to be related to hunger-satiation such as deprivation, food, and place of eating were used and scored on the basis of imagery, themes, needs, activities, and goals. Increases in food related fantasies between short and long deprivation were scored either +1 or +2, depending on the size of the shift, while decreases in the food related responses were given equivalent negative values. No score was given to responses which did

not change. Prior to responding, the subjects had been exposed to 1, 4 or 16 hour periods of food deprivation. It was found that this system differentiated the 1 and 4 hour groups from the 16 hour group. Thus, thematic apperception or fantasy was shown to differentiate between need or motive states involving hunger.

A similar, but more complex, design was used to create different degrees of the need for achievement ( $n_{ach}$ ). (McClelland et al., 1949, 1953; Atkinson, 1958) In this study, the subjects were asked to respond to pictures depicting achievement related situations by writing five minute stories. Shifts of story characteristics between arousal conditions served as the basis for the scoring which was essentially similar to that utilized in the hunger studies. The conditions of arousal which were utilized by the investigators included: (1) the relaxed condition, on which the subjects were told that they were trying out some tests and made to believe that the tests, not the subjects, were being tested; (2) the failure condition, which utilized bogus norms from other academic institutions to emphasize the low, inadequate or failure, performance of the subjects; (3) the neutral condition, on which the group was asked to do their best so that satisfactory norms could be developed, i.e., no norms were announced; (4) the success-failure condition on which the bogus norms were so low that almost all subjects attained good scores; (5) the achievement-oriented condition, which did not utilize norms but incorporated the instructions from the failure condition; and (6) the success condition which utilized instructions from the failure condition in addition to norms which were so low that most of the subjects believed they did well on the tests. The Test of Creative Imagination, i.e. a modified version of the Thematic Apperception Test, was given to each group after the completion of each experimental condition. The



results indicated that subjects exposed to the relaxed and neutral conditions attained lower n Ach scores than individuals subjected to various conditions explicitly involving achievement such as failure, success, success-failure, and achievement-orientation. The success-failure condition showed the same percentages of achievement fantasy as the failure conditions. This indicated that the n achievement scores attained from the TAT increased significantly in accordance with the presumed increase in induced need from relaxed, to neutral, to the failure conditions.

#### Objective Test Methods

Attempts have also been made at using methods other than the TAT to measure the n achievement motive described by McClelland. However, most of the substitute methods of measuring achievement motivation have proved to be unsuccessful when an appreciable correlation with achievement scores derived from the content analysis of fantasy is used as the criterion of success. Much of the available research, as a result, utilizes the McClelland scoring system. Value achievement or v achievement (de Charms et al., 1955) was one method purposely designed as a substitute for the TAT procedure. Each subject participating in the initial validating experiment was requested to check the extent of his agreement with nine questionnaire items, all but one of which were based upon Murray's original study. The v achievement score was the sum of the subject's responses. This score was obtained by collecting six stories which represented the responses to briefly exposed slides viewed by subject groups. The v achievement score was found to exhibit a low, positive and significant relation to n achievement. ( $\rho = .23$ ) It was concluded, however, that v achievement was not at all comparable to the projective method of measuring n achievement since it was also related to conformity, deference to expert opinion, and evaluation of people in

terms of their success and failure. None of these relationships were found for n achievement. Thus, v achievement was not a totally acceptable substitute for McClelland's projective method of measurement.

Raphelson (1957) attempted to correlate Thematic Apperception n achievement scores with scores from the Mandler-Sarason Test Anxiety Questionnaire after administering both instruments to the same subjects. Under achievement-oriented conditions, this correlation was found to be  $-.43$ . It was also found that Test Anxiety scores were positively related to psychogalvanic skin reaction (sweating) in an achievement test situation. However, a negative correlation was found between this physiological symptom of "anxiety" and n achievement scores.

An insignificant negative correlation of  $-.15$  was found by Atkinson and Litwin (1960) between n achievement scores and test anxiety scores when both tests were administered under neutral conditions. Thus, there appears to be no significant relationship between n achievement and test anxiety among male college students when both tests are administered under neutral conditions; results which were inconsistent with the Raphelson (1957) study. However, a study by Scott (1956) suggested that the negative correlation obtained by Raphelson was probably a result of the fact that he assessed n achievement under relatively stressful achievement oriented conditions.

In three different studies, subjects were asked to write or tell imaginative stories about a series of ambiguous pictures under two different conditions. No intentional suggestion as to what the content of the stories should be was the first condition (low cues). The second condition (high cues) allowed the same subjects to focus their attention on a particular event which could have been threatening to some of them. War catastrophe was presented as the potentially threatening event in

one of the studies. Competition with a standard of excellence was the focus of the other two studies. Sizeable proportions of the subjects exhibited decreased tendencies to tell stories about the threatening event under high-cue as compared with low-cue conditions in all three studies. A content analysis of the stories revealed that when avoiders told stories about the event, they displayed symptoms of fear within their stories. When they got around the "threatening situation" by telling stories about some other non-threatening event, however, the symptoms of fear disappeared. No significant differences between the two groups was found when their stories dealing with non-threatening events were compared.

The demonstration of this relationship between studies of n achievement and studies of test anxiety provided a basis for the assumption that n achievement and test anxiety are normally uncorrelated among male college students. Atkinson (1964) also made the following additional assumptions:

When a group is high (above the median) in n achievement, one can assume that the achievement motive ( $M_S$ ) is relatively strong in relation to the average strength of the unmeasured motive to avoid failure ( $M_{af}$ ) in such a group. When a group is low (below the median) in n achievement, one can assume that the achievement motive ( $M_S$ ) is relatively weak in relation to the average strength of motive to avoid failure ( $M_{af}$ ) in such a group. The absence of correlation between n achievement scores and test anxiety scores means that the average test anxiety score is the same among High and Low n achievement groups. Hence, relative to the strength of n achievement (which has been measured), test anxiety is a more potent influence on the behavior of persons scoring low than high on n achievement. (Atkinson, 1964, pp. 249-250)

Thus, when anxiety about failure was strongly aroused in some subjects, it inhibited the expression of achievement oriented responses in Thematic Apperceptive stories which might otherwise have been expressed under

neutral conditions.

Several attempts were made to measure achievement motivation with simple objective paper and pencil tests. The Achievement Risk Preference Scale (ARPS), for example, was constructed by Atkinson and O'Connor (1962). The scale consisted of a series of paired comparisons in which the individual high in achievement motivation could make a different choice than the person low in achievement motivation. Measures of risk preference, speed of performance, and persistence were obtained from thirty-five male college students after having them perform a variety of tasks under achievement motivation. Each subject then completed the ARPS. Next, a second testing period was scheduled and the students were asked to respond to both the standard TAT measure of achievement motivation and the Mandler-Sarason Test Anxiety Questionnaire. The hypothesis that individual preference for intermediate risk is positively related to achievement motivation was confirmed, a finding consistent with earlier work utilizing the standard TAT method measurement. A speed test, and a task yielding a measure of persistence were found to be positively related to TAT scores but negatively related to ARPS performance. As a result, the authors concluded that the ARPS lacked predictive validity and did not relate to achievement oriented performance in the same manner as the standard TAT method of measurement.

More recently, Carney (1966a) reported significant correlations between the TAT projective measure of achievement motivation and an objective-type questionnaire index based on the Dominance, Capacity for Status, Sociability, Social Presence, and Self Acceptance scales of the California Psychological Inventory (CPI). These results indicated that projective and objective techniques of measurement can be utilized to determine the same motive. According to Carney:

What the fabled difference between objective and projective measurement resolves itself into, then, is that objective techniques produce a relatively standardized stimulus situation which elicit relatively standardized behavior, while projective techniques often produce non-standardized behavior which is elicited by non-standardized extra-test situational factors. . . . TAT responses are assumed to be largely determined by the immediate situation. It is when the situation extra to the test provides cues for achievement motivation, that the TAT and questionnaire measures should coincide. (Carney, 1966a) pp. 676-679

Thus, the results of this study suggest that either objective or projective techniques can be utilized to measure the same motive.

Additional validation studies for the objective measure of achievement motivation derived from the CPI were provided by Carney, Mann, and McCormick (1966b). These investigators used the objective measure as a dependent variable to be manipulated by appropriate instructions in four experiments. In all cases, the conditions of arousal were identical to those reported by McClelland (1958). Results showed that specific achievement arousal effects were obtainable in the face of much variation in extraneous conditions. Thus, the experimental effect was small but stable when compared to that obtained with the standard TAT procedure. This finding was not unusual, however, since the TAT is usually considered to be more sensitive to situational variables. The study provided strong evidence for the validity of the objective technique for determining achievement motivation.

#### Semi-Projective Methods

Because the utilization of the McClelland TAT technique required special administrator training and interrater reliability among skilled raters was often low, The Iowa Picture Interpretation Test (IPIT) was developed as another possible substitute measure of achievement motivation. (Hurley, 1955) In order to integrate the objective and

quantitative advantages of traditional paper and pencil personality measures with the depth ensuing from projective measurement, undergraduate students at the State University of Iowa were asked to rank four descriptive interpretative statements describing each of ten TAT pictures. One of the four interpretations of each picture involved achievement. As a group, these statements were consistent with McClelland's prior work in the area. The other three interpretations for each picture were designed to indicate hostility, security, and blandness. A significant positive correlation was found between achievement scores and the number of correct anticipations in a serial (rote) learning task when the subjects were given poorly motivating instructions. The correlation was insignificant when high motivational instructions were used, however. A tendency for achievement scores to be positively correlated with the number of erroneous anticipations under low motivational instructions was also noted. These results were confirmed by Bendig (1957) who also found little or no relation between TAT achievement and achievement scores from the Edwards Personal Preference Schedule.

Other studies utilizing the IPIT have offered conflicting results. Williams (1955), for example, found that individuals attaining high achievement scores on the IPIT performed a simple test of addition faster than low achievement scorers. This finding was consistent with a previous work by Lowell (1952b) who utilized McClelland's scoring method. Separate studies by Johnston (1955, 1957) respectively found high achievement subjects of both sexes attempted significantly more addition problems during 102 minute trials and performed more effectively on an electrical maze task than low achievement scorers. Finally, a positive relation between IPIT achievement scores and the frequency of both correct and incorrect verbal learning responses was found by

Hurley (1957). All of these studies suggest that IPIT achievement ratings may reflect individual motivational differences. Much additional research needs to be done, however, before the IPIT can be unconditionally accepted as a measure of achievement motivation.

Another attempt to objectify the achievement score categories obtained from subjects exposed to achievement-type TAT pictures was made by Hedlund (1953). This objective multiple-choice device, called the Iowa Multiple-Choice Achievement Imagery Test, consisted of 70 three foil-items. Two of the three foils were unrelated to achievement, while the third was an achievement related statement. Each item was constructed from statements made in response to 300 stories which had been written about seven pictures. Prior to their selection, the statements had been scored for achievement imagery by an experienced judge. In all, ten items were constructed for each of the seven pictures. Parallel administrations of both the newly constructed objective test and the standard story form revealed that neither test consistently yielded comparable estimates of the relative need for achievement of different individuals. It was also found that neither Hedlund's objective test nor the standard story form could be related in a clear cut manner to either classroom performance or an anagrams test. Thus, the study failed to validate the Iowa Multiple-Choice Achievement Imagery Test and did not corroborate the relationship between achievement scores and anagram test performance which had been previously reported by Clark and McClelland (1950).

A measure of both the achievement motive and the need for affiliation which did not involve the use of pictures was developed by French (1956). This test required the subject to respond to a set of items describing behavior which was characteristic of a hypothetical man by writing a statement which explained the man's behavior. Individuals

high in achievement motivation were expected to project that motivation into their explanation of hypothetical behavior. There were a total of 10 items included in the final form of the test. These Test of Insight scores were correlated with observational judgments of motivation and goal attainment for both achievement and affiliation. This resulted in a correlation range of  $-.05$  to  $+.05$ . The respective correlations between goal attainment and judgments of motivation were  $.83$  and  $.82$ . Thus, the hypothesis that observational judgments of motivation which cannot be directly observed tends to be based upon goal attainment which can. This, in turn, indicated that the French Test of Insight was a valid measure of achievement motivation and affiliation.

Aronson (1956) developed a promising technique which was also projective or expressive in nature. Because the verbal nature of the TAT method of measuring achievement motivation was difficult to administer in situations involving children, too young to tell stories, to civilizations without written records, to individuals whose anxiety interfered with fluent writing, and to groups who spoke different languages, this investigator attempted to utilize the content analysis for spontaneous doodles as a measure of achievement motivation. To test his procedure, 196 male college students were asked to respond to the standard achievement testing procedure. To elicit graphic expression, the subjects were then asked to reproduce tachistoscopically presented scribble patterns. In order to discover the empirical relationships between various modes of graphic expression and achievement motivation, the subjects were divided into groups, each group being exposed to different designs. The graphic expressions involved allotting either a respective  $+1$  or  $-1$  for discreteness or fuzziness of each reproduction. All of the product-moment correlations between achievement and the discrete-fuzzy



variable were in the predicted direction. Thus, graphic expression was positively correlated with McClelland's standard TAT method of measuring achievement motivation.

### The Zeigarnik Effect

The concept of inertial tendency, i.e., the idea that once the tendency to attain some particular goal is aroused and thwarted a general tendency toward the class of goal ( $T_G$ ) persists, was described earlier in this chapter. This theoretical postulate indicated that the general inertial tendency to achieve success which persists after failure also effects the strength of any subsequently aroused tendency to achieve success at either the same or different tasks. In turn, a reduction in any goal-directed tendency might be expected when the goal is attained. Thus, a greater initial tendency to achieve might be expected after failure, while prior success would be expected to result in a smaller inertial tendency to achieve. This exploration goal seeking behavior is very similar to Lewin's theory of motivation. According to this theory:

. . . the property of a need or quasi-need can be represented by coordinating it to a 'system in tension'. By taking this construct seriously and using certain operational definitions, particularly by correlating the 'release of tension' to a 'satisfaction of the need' (or the 'reaching of the goal') and the 'setting up of tension' to an 'intention' or to a 'need in a state of hunger', a great number of testable conclusions were made possible. (Lewin, 1951) pp. 5-6

Thus, Lewin postulated that persons who accepted tasks were effected by a motivation (intention or quasi-need) to complete the task.

One way of demonstrating this behavior was by determining the extent to which interrupted activities would be resumed when the opportunity to do so was provided. Determining the difference between recall of completed and incompletd tasks was a second demonstrative method.

Attempts were also made to determine the effect substitute activities would have on the resumption of another activity interrupted before the substitute tasks were performed. Finally, an effort was made to determine whether or not tension could be reduced by continuous repetition of the interrupted task.

### Initial Studies

The theory that the effect of an intention was equivalent to the creation of an inner personal tension was first experimentally tested by Zeigarnik (1927) when she first attempted to study memory for completed and incompleted tasks. The subjects in this experiment were asked to attempt a number of different puzzle and problem tasks. Half of the group was allowed to work until they were able to complete the tasks. The other half was interrupted before task completion. After the tasks had been placed out of sight, Zeigarnik asked each subject in an informal manner to recall some of the activities he had worked on. It was found that the names of the interrupted tasks were retained better than the names of the completed tasks. Better recall of the interrupted tasks was attributed to the tension state established as a result of not allowing the experimental group to complete the tasks. Other early investigations (Marrow, 1938; and Pachouri, 1935) also demonstrated that interrupted activities are better recalled than completed ones.

Zeigarnik's study was duplicated and repeated by Ovsiankina (1928) in all essential details except one. Rather than putting the tasks away after they had been worked on, the subjects were allowed to spontaneously resume work at any one of the activities. The results showed that activities which had been interrupted prior to completion were usually resumed. This was interpreted to mean that the intention for task completion persisted beyond the point of interception. Thus, it exerted

influence on the subjects' task recall ability. The finding that an individual tended to resume an interrupted activity at the earliest opportunity was also demonstrated by Adler and Kowin, 1939; Freeman, 1930; Katz, 1938; and Coopersmith, 1960.

When studies of task recall were conducted in America, many investigators found a partial reversal of Zeigarnik's results. Rosenzweig (1943), for example, had college students solve a series of jig-saw puzzles under conditions allowing either completion or interruption. Half of these subjects were made "ego-defensive" by informing them that they were being tested for intelligence. The other half were informed that the tasks were being tested (the need-persistent group). It was found that significantly more of the task-oriented group recalled the unfinished tasks. Conversely, the relation was reversed for the ego-involved group. These results were inconsistent with those previously set forth by Zeigarnik. In addition, results from other investigations showed similar inconsistencies (Glixman, 1948, and Caron and Wallach, 1957).

#### Influencing Personality Processes

Clues pertaining to the underlying personality processes influencing the Zeigarnik phenomenon were provided by Cartwright (1942). The subjects participating in this study were asked to estimate the attractiveness of experimental tasks before and after interruption. It was found that valence increased after interruption for subjects who spoke confidently about future completion. It decreased, however, for persons who expected failure, i.e., persons who believed they would not be able to complete the interrupted tasks. Thus, the presence of either success or failure expectations resulted in a respective strengthening or weakening of the motive arousal for the external event; in this case an

interrupted task. These findings suggested the possibility that the disappearance of the Zeigarnik Effect under ego-involvement might have resulted from attempts by the subjects to solve tasks which were too difficult. This difficulty might have been caused by experimenter failure to allow enough time for task solution. As a result, the subjects would have perceived the tasks as impossible rather than incomplete. Tasks effected in this manner were not considered to be good failure situations. Other investigators (Atkinson and Raphelson, 1956; and Caron and Wallach, 1959) also obtained results indicating that the recall of unfinished tasks increased as a function of the strength of achievement motivation when the situation indicated that noncompletion was associated with failure.

The apparent contradiction between the findings of Zeigarnik and Rosenzweig were in part resolved by Atkinson (1953). He attempted to study the differences in recall of interrupted and completed tasks in relation to individual differences in strength of the achievement motive (n achievement). Subjects participating in this study were divided into three groups (task-oriented, relaxed, and ego-involved), and asked to attempt twenty similar-looking paper and pencil tasks. Although the tasks looked similar, both a long form and a short form were utilized. A time limit was devised so that the shorter tasks were completed and the long ones were not. The TAT n achievement test was administered immediately after the subjects were asked to stop working on the tasks. It was found that high need achievers tended to recall more incompleted than completed tasks under the relaxed orientation while showing a small difference in the same direction under task orientation. Slightly more completed than incompleted tasks were recalled under the ego-involved condition. These results indicated that low need achievers were made

uneasy or fearful of failure by ego involvement which implied a test of their ability. As a consequence, successfully finished tasks were recalled in an attempt to resolve their uneasiness. On the other hand, ego-involvement appeared to motivate high-need achievers differently, because they remembered the tasks they had failed to complete to an extent much greater than their memory for completed tasks.

#### Influencing Environmental Factors

The Zeigarnik Effect was utilized by Green (1963) in a study which attempted to determine whether the proportion of interrupted tasks recalled would differ between volunteers serving by choice, draftees not willing to volunteer, and draftees who had been willing to volunteer (a category falling between the previous two). The subjects in each of these three groups were given either task or ego-orientating instructions. Results indicated that task orientation led to the recall of more interrupted than completed tasks. This tendency was reversed with ego orientation. The differences among the volunteering groups confirmed the hypotheses that the proportion of interrupted tasks recalled would be greatest among volunteers serving by choice and least among draftees not willing to volunteer. Draftees who had been willing to volunteer fell between the two.

The recall of completed and incompletd tasks was also utilized as a means of investigating the motivational effects of social context on achievement striving (Weiner 1966b). A male competing against a male, a female competing against a female, and male competing against a female were the three experimental conditions emphasized. Pairs of subjects were seated at a table facing the experimenter. A partition was placed between them and they were told that the experiment investigated the effects of competition on performance. Points were awarded for the

successful completion of each task. At the end of the experiment the points were to be added, the winner being the individual with the highest total. Males were found to exhibit a significantly greater Zeigarnik Effect when competing against females than when competing against males. Similarly, females showed a greater Zeigarnik Effect when competing against females than when competing against males. The latter difference, however, was not statistically significant.

#### Examination Item-Recall

More recently, Weiner, Johnson, and Mehrobian (1968) asked 205 male students enrolled in an undergraduate personality course at the University of California, Los Angeles, to indicate their levels of aspiration (i.e., the number of examination items they thought they would get correct out of 58) and to recall the specific questions after completing an actual examination. No attempts were made to control for either intelligence or reading comprehension. The results showed that subjects high in resultant achievement motivation recalled a greater percentage of failed to pass items. Although the trend for individuals low in resultant achievement motivation was similar, it was considerably smaller. To explain these results, the authors hypothesized individuals high in achievement motivation covertly rehearse and think about the missed questions more than subjects low in achievement motivation. In short, the Zeigarnik Effect was hypothesized to be a learning rather than a memory phenomenon.

A study by Caron and Wallach (1957) was cited to support this hypothesis. The subjects participating in this study were told that the interrupted tasks were insoluble after the initial recall period was completed. As a result, there was no instrumental inducement for subjects striving for success to retain the material nor any persisting

source of motivation for relatively anxious individuals to repress the tasks. The differential retention found at the end of the first recall period was expected to dissipate following the information about the insolubility of the interrupted tasks. This did not occur, however, since the customary differences in the pattern of recall between the motive groups was still observed after the feedback. Thus, the recall differences were attributed to differential learning, rather than differential memory.

#### Summary

The initial model of achievement motivation proposed by Atkinson (1957) specified that subjects in whom  $M_s > M_{af}$  are most attracted to tasks of intermediate difficulty ( $P_s = .50$ ). Tasks which are very easy or very difficult are most attractive for individuals in whom  $M_{af} > M_s$ . Studies by Atkinson and Litwin, 1960; McClelland, 1958; Mahone, 1960; Moulton, 1965; and Weiner, 1965b substantiate the differential task preference predicted by this model. A revised model (Weiner, 1965) specified that subjects high in resultant achievement motivation were most aroused to achieve success when attempting a task of intermediate difficulty after experiencing failure. These individuals were least motivated to attempt a task perceived as easy after experiencing repeated success. After being subjected to failure experiences, they were most inhibited when attempting a task where  $P_s = .50$ . These predictions were confirmed in studies conducted by Weiner, 1965b; 1966a; and Weiner and Rosenbaum, 1965.

A modified version of the Thematic Apperception Test has traditionally been utilized as a measure of achievement motivation. Subjects involved in this procedure were asked to write five minute stories in

response to TAT pictures depicting achievement related situations. This method was validated in studies by Atkinson and McClelland, 1948; McClelland et al., 1949; 1953; and Atkinson, 1958. Attempts at using methods other than the TAT to measure the achievement motive have generally been unsuccessful (deCharms et al., 1955; Raphelson, 1957; Atkinson and Litwin, 1960). Semi-projective methods have been only moderately successful (Hurly, 1955; Bennig, 1957; Williams, 1955; Hurley, 1957; Hedlund, 1953; French, 1956; and Aronson, 1956). Recently, Carney (1966a) reported a significant correlation between the projective measure of achievement and an objective type questionnaire index based on the Dominance, Capacity for Status, Socability, Social Presence and Self Acceptance scales of the California Psychological Inventory. This measure of achievement motivation was given additional validity in a study by Carney, Mann and McCormick (1966b) which followed the same procedure as that initially utilized to validate the standard TAT method. Thus, the objective method devised by Carney appears to be an acceptable substitute for the standard TAT approach.

Initially, studies utilizing the Zeigarnik Effect were attempts to study memory for completed and incompletd tasks. (Zeigarnik, 1927; Ovsiankina, 1928; Adler and Kowin, 1939; Freeman, 1930; Katz, 1938; Coppersmith, 1960; Rosensweig, 1943; Glixman, 1948; and Caron and Wallach, 1957.) Investigations by Cartwright (1942) and Atkinson (1953) related underlying personality factors (such as achievement motivation) to differences in recall of interrupted and completed tasks. Thus it was found that high need achievers tended to recall more incompletd than completed tasks under relaxed orientation. These individuals recalled more completed than incompletd tasks under ego-involved orientation. This line of investigation led to a study by Weiner, Johnson and



Mehrobian (1968) which found that individuals high in resultant achievement motivation recalled a greater percentage of failed than passed items. To explain their results, these authors hypothesized that individuals high in achievement motivation covertly rehearse and think about the missed questions more than subjects low in achievement motivation. Thus, the Zeigarnik Effect was considered a learning rather than a memory phenomenon.

## CHAPTER III

### METHOD

Subjects. The subjects selected for the study were all freshman males enrolled at Oklahoma State University, Stillwater, and St. Gregory's College, Shawnee, Oklahoma, during the fall semester, 1968. Initial contact with these individuals was made either during orientation prior to the opening of school or during initial sessions of Introductory Psychology. Only those students who had completed four years of high school and had never enrolled in college were included in the sample. Students who had previously participated in classwork at either Oklahoma State University or some other college were not included. A frequency distribution of subject ages is presented in Table I. The modal subject age was 18 years. The distribution ranged from 17 to 24 years. In all cases, the subjects were asked "to volunteer as a participant in psychological research" and scheduled for an appointment which was convenient to them. Any attempt on their part to determine the nature of the research was avoided. While a more comprehensive and random sample would have been desirable, cost and availability made this approach impossible.

Materials. The following psychological instruments were used in the study: (1) The California Psychological Inventory (CPI), (2) The American College Test (ACT), (3) The Nelson-Denny Reading Comprehension Test, (4) The Rotter Incomplete Sentence Blank, (5) The Professional Success Test (PST). All instruments were administered as part of the

TABLE I  
FREQUENCY DISTRIBUTION OF SUBJECT AGES

Age	f	Cumulative f	Cumulative %
24	1	211	100.0
23	0	210	99.5
22	1	210	99.5
21	5	209	99.0
20	3	204	96.6
19	12	201	95.2
18	141	189	89.5
17	48	48	23.7

$\bar{X} = 17.98$   
 $SD = .18$

experiment except the ACT and reading tests. Subject scores on these instruments were obtained from college files. The PST was a synonym test especially constructed for the study.

The California Psychological Inventory. (Gough, 1964) The California Psychological Inventory (see Appendix A), selected to serve as the device with which to obtain measures of achievement motivation, consists of 480 items. The subjects were instructed to respond to the items which are presented in the form of a true-false type scale by answering true if an item described them and false if an item did not describe them. The subjects were instructed to answer each item on the scale; each test item eliciting the subjects' response to one specific personality characteristic. Although the inventory consists of 18 scales which measure separate facets of interpersonal psychology, only the Dominance (Do), Capacity for Status (Cs), Sociability (Sy), Social Presence (Sp), and Self-acceptance (Sa) scales were utilized in this study.

The author defined these scales and described their purpose in the following manner:

1. Do (dominance). To assess factors of leadership ability, dominance persistence, and social initiative.
2. Cs (capacity for status). To serve as an index of an individual's capacity for status (not his actual or achieved status). The scale attempts to measure the personal qualities and attributes which underlie and lead to status.
3. Sy (sociability). To identify persons of outgoing, sociable, participative temperament.
4. Sp (social presence). To assess factors such as poise, spontaneity, and self-confidence in personal and social interaction.
5. Sa (self-acceptance). To assess factors such as sense of personal worth, self-acceptance, and capacity for independent thinking and action. (Gough, p. 10)

The raw score for each scale was obtained by placing a scoring template on the answer sheet, counting the X's which showed through the

template and entering the total in the proper cell at the bottom of the answer sheet. The raw scores for each of the five pertinent subscales were then converted to standard scores by referring to the "Table for Converting CPI Raw Scores to Standard Scores" in the Manual for the California Psychological Inventory (Gough, 1964). The measure of achievement motivation was obtained by averaging these standard scores for each subject.

Reliability for the inventory was originally based on two studies. In the first, 226 subjects in two high school junior classes, one in Texas and the other in Pennsylvania, were administered the CPI during the fall of 1952. One year later, they attempted it again as seniors. In the second study, 200 male prisoners in California attempted the test twice with a lapse of from 7 to 21 days between testings. The test-retest reliability correlations for the five scales used to measure achievement motivation are shown in Table II. These correlations range from .63 to .72 for high school females, .60 to .67 for high school males, and .76 to .80 for prison males.

Validity data was obtained by comparing staff ratings made by outside sources such as teachers, psychologists and military officers with the scores from each of the CPI subscales. The correlations between the various criterion ratings and the CPI scores for the Dominance, Capacity for Status, Social Presence, and Self Acceptance subscales are shown in Table III. These correlations range from .32 to .48.

Additional validation evidence was obtained from principals in various high schools who were asked to nominate the "most" and "least" dominant students, the "most" and "least" participant students (sociability), the students believed to be "highest" and "lowest" in Social Presence, and the students ranking "highest" and "lowest" on self

TABLE II

TEST - RETEST RELIABILITY CORRELATIONS FOR THE FIVE (SUBSCALE) AREAS  
OF THE CALIFORNIA PSYCHOLOGICAL INVENTORY

Scale	High School Females N = 125	High School Males N = 101	Prison Males N = 200
Dominance (Do)	.72	.64	.80
Capacity for Status (Cs)	.68	.62	.80
Sociability (Sy)	.71	.68	.84
Social Presence (Sp)	.63	.60	.80
Self Acceptance (Sa)	.71	.67	.71

(Gough, 1964)

TABLE III

VALIDITY CORRELATIONS BETWEEN STAFF RATINGS AND CPI  
ASSESSMENTS OF VARIOUS SUBJECT GROUPS

Scale	Subjects Groups	Correlation
Dominance (Do)	70 Medical School Applicants	+.48
	100 Military Officers	+.40
Capacity for Status (Cs)	100 Military Officers	+.38
Social Presence (Sp)	70 Medical School Applicants	+.32
Self Acceptance (Sa)	70 Medical School Applicants	+.43
	40 Graduating Engineering Seniors	-.57

(Gough, 1964)

acceptance. The separate subscale correspondence with each appropriate nomination was significant at the .01 level. (Gough, 1964, pgs. 20-21)

The CPI was chosen as the measure for achievement motivation because it was shown to respond to the type of validating procedures used for projective measures (Carney, Mann, and McCormick, 1966) and administration to large numbers of subjects could be economically facilitated by using an objective alternate to the standard TAT measure.

The American College Test (ACT, 1968). The American College Test composite score used in this study was derived from the battery of tests administered through the American College Testing Program, Inc. of Iowa City, Iowa. Each freshman entering Oklahoma State University is required to complete this battery of tests. The American College Test (ACT) battery is generally taken during the senior year of high school. When this is not done, it is taken during the orientation and advisement clinic which freshmen attend prior to enrollment. The test is generally described in the following manner:

This battery consists of four tests--one each in the areas of English, mathematics, social studies and natural science. The tests average 45 minutes in length and are designed to measure the student's ability to perform the kinds of intellectual tasks college students typically perform. The tests place primary emphasis upon what the student can do with what he has learned, rather than upon what he had learned in the sense of detailed and specific subject matter. In other words, test items are concerned with intellectual skills and abilities--not with specific and detailed content. (ACT 1963-64)

Four scores (i.e., English Usage, Mathematics Usage, Social Studies Reading, and Natural Science Reading) and a composite or average score are the components of this part of the battery. The retest reliabilities of the ACT battery range from .67 to .84 over a two year interval. These correlations are presented in Table IV.

Predictive validity was obtained for the test by obtaining multiple



TABLE IV

ACT TEST - RETEST RESULTS OVER A TWO YEAR PERIOD  
N = 63

	<u>Test</u>		<u>Retest</u>		<u>Correlation</u>
	Mean	s.d.	Mean	s.d.	
English	20.5	4.4	21.9	3.8	<del>.73</del> .69
Mathematics	19.3	5.0	19.9	5.6	.77
Social Studies	21.3	5.6	24.2	5.0	.67
Natural Sciences	20.8	5.1	22.1	4.9	.70
Composite	20.6	4.0	22.1	3.6	.84

(ACT Technical Report, 1965)

correlations between ACT scores and academic criteria from a 20 percent random sample of colleges using the test during 1962, 1963, and 1964. This is shown in Table V. The median predictive validity of the individual ACT tests ranged from .37 to .50. (ACT Technical Report, 1965)

The composite score was selected to be used as an indicator of intellectual ability because it is considered the best single ACT measure of scholastic performance. It was also a widely used and readily available indicator of student capability.

The Nelson-Denny Reading Test. (Nelson and Denny, 1960) There are two comparable forms of the Nelson-Denny Reading Test, Form A and Form B. Each form consists of 100 vocabulary items and 36 items which measure reading comprehension. Both the vocabulary and comprehension parts of the test were administered during the orientation and advisement clinic which freshmen attend prior to enrollment. Only the Reading Comprehension scores from Form A (see Appendix B) were used in this study. The median multiple correlation for the Composite score was .497.

Because speed was an important factor, the equivalent forms method of calculating reliability coefficients was considered to be more appropriate than the split-half technique. The Reliability coefficient for the Reading Comprehension Test, shown in Table VI, was .81. The test is designed for use in grades nine through 16. Each grade for which the test is designed has its own set of norms. The mean and standard deviation for Grade 13, Form A, are respectively 41.50 and 13.18.

Validity was established by making an item analysis and determining the difficulty level of each item as well as the internal consistency of the test. The results of the item analysis for the Comprehension Subtest are presented in Table VII. Table VII shows that the average difficulty of the revised forms is slightly less than that for the original.

TABLE V

PREDICTIVE VALIDITY OF THE FIVE ACT TEST SCORES

Variables	Number of Colleges	Number of Students	Median r
English test v.s. College English GPA	122	54,335	.498
Mathematics Test v.s. College Mathematics GPA	91	27,582	.374
Social Studies Test v.s. College Social Studies GPA	119	42,990	.466
Natural Sciences Test v.s. College Natural Science GPA	106	38,030	.374
Composite v.s. College Overall GPA	122	59,164	.497

(ACT Technical Report, 1965)

TABLE VI

## RELIABILITY COEFFICIENTS FOR THE NELSON - DENNY READING TEST

Part	r	N
Vocabulary	.93	110
Comprehension	.81	110
Total	.92	110

(Nelson & Denny, 1960)

TABLE VII

VALIDITY AND DIFFICULTY DATA FOR ITEMS IN THE  
READING COMPREHENSION SUBTEST

Form	No. of Items	<u>Validity</u>		<u>Difficulty</u>	
		Range	Mean	Range	Mean
Original A	36	12-64	44.1	29-91	68.1
Original B	36	16-67	44.3	40-95	71.2
Revised A	36	25-64	44.6	29-95	71.2
Revised B	36	26-67	45.3	30-95	71.4

(Nelson & Denny, 1960)

This resulted from extending the range downward and by avoiding the use of too many items at any one difficulty level on the revised test.

The Rotter Incomplete Sentence Blank. The first fifteen questions were taken from the Rotter Incomplete Sentence Blank (see Appendix C) and used as a means of diverting each subject's attention from the Professional Success Test. Because the purpose of the Sentence Completion task was solely diversionary in nature, the specific performance of each subject was not included as part of this experiment. Each individual was required only to complete each sentence to the best of his ability. In all cases, the subjects were naive as to the real nature of the task.

The Professional Success Test. A synonym-test was especially designed for this study (see Appendix D). The rationale used in its development was based on an attempt to simulate a situation with some of the structural aspects that are presented by a multiple-choice objective test and to simultaneously provide a means of reducing differential item rehearsal. A multiple-choice item having one word segments attached to separate cards in a loose-leaf notebook seemed most appropriate, since control could be facilitated by instructing the subject to look at each word on each separate card only once. Enforcement could be attained by proctoring small groups of subjects and preventing them from viewing any card more than once. Using a multiple-choice test item seemed reasonable, because it is a commonly used method of presenting objective test material. Although a teaching machine programmed to allow each subject to view each item-segment only once might have been substituted for the loose-leaf notebook, these devices were not available in large enough quantities to permit efficient utilization of experimental time.

The first two items of the task were sample problems. They served to introduce the subject to the task and to demonstrate the appropriate

procedure. The next twenty-two items were problems which the subject was asked to solve. Each item was made up of a set of five words, two of which were synonyms. The cards were cut to different lengths in order to facilitate turning. To facilitate ego-involvement in the task, the test was entitled The Professional Success Test. The subjects' task was to select the one word in each set of five which was synonymous or had the same meaning as the first word in the set. Each item had only one feasible solution (a,b,c, or d) which the subject marked on his answer sheet. For successful performance, the subject had to look at each of the five words as he turned each separate card on which they were mounted. Then, he had to match the initial word with one of the remaining four which appeared to have an identical or synonymous meaning.

These particular items were selected from words listed in Roget's Thesaurus (1965). Initially, one-hundred vocabulary items were chosen either because they appeared extremely difficult or because they seemed extremely easy. This larger list was then administered to 100 second semester freshmen enrolled in Introductory Psychology at Oklahoma State University during the spring, 1968, semester. Next, the difficulty level of each item was computed according to the procedure described by Freeman (1963). Using this method, difficulty level ". . . is determined by the percentage of individuals able to pass each item". (p. 113) Thus, an item which was answered correctly by 20 out of 100 students had a difficulty level of .20 (i.e.,  $20 \div 100$ ). An item answered correctly by 80 out of 100 subjects had a difficulty level of .80 (i.e.,  $80 \div 100$ ). After computing the difficulty level for each of the items in the large list, eleven (11) items having a .80 difficulty level and eleven (11) items having a .20 difficulty level were selected for incorporation into the synonym test. The difficulty levels were arbitrarily selected in

order to ensure an opportunity for each subject to experience both success and failure when attempting the synonym test. The final form of the test consisted of an alternation between extremely easy and extremely difficult items, i.e., all even numbered items had a difficulty level of .80, while all odd numbered items had a difficulty level of .20.



## CHAPTER IV

### PROCEDURE

Procedure. There were four phases to the basic experimental procedure: (a) administering the California Psychological Inventory to each of the 211 subjects who participated in the experiment, (b) administering the Professional Success Test to each of the participating subjects, (c) having each subject complete the phrases on the Rotter Incomplete Sentence Blank, and (d) asking each subject to recall as many of the items from the Professional Success Test as possible.

Initially, each subject was seated at a table, given a test booklet for the California Psychological Inventory, and read the standardized instructions which accompany it. As soon as this task had been completed, each subject was randomly assigned to one of four basic treatment groups (Interrupted Controlled Rehearsal, Interrupted Uncontrolled Rehearsal, Completed Controlled Rehearsal, and Completed Uncontrolled Rehearsal) and given a notebook containing presentation cards for the Professional Success Test (PST) in addition to an answer sheet numbered to correspond to the items of the test. The following directions for the PST were given:

This is The Professional Success Test. It is designed to determine or predict how well you will do in your chosen occupational area of endeavor. There are 22 items in all. Each item consists of five separate words. You are to read the first word and then decide which of the remaining four words are synonymous (or have the same meaning). Write the letter of this word in the corresponding blank on your answer sheet. The first two items are samples to help you become familiar with the test. Open your test booklet to

Sample Item #1. (Time was allowed for the subjects to open the books to the correct item.) You may turn the cards of your test booklet as I read the words. On Item #1, the first word 'house' is synonymous or means the same as one of the following words: '(a) tree, (b) stone, (c) dwelling, or (d) cat'. (Here, time was allowed for the subjects to page through the cards for the first sample item and to find the correct answer.)

The answer to Sample Item #1 is letter 'c', 'dwelling'. All you have to do is write letter 'c' on your answer sheet in the blank corresponding to Sample Item #1. Now, go ahead and try the second sample item. Be sure to stop when you have finished it.

At this point, those subjects belonging to the Controlled Rehearsal groups (i.e., those groups which were not allowed to return to any previously attempted test item) were given the following additional instructions:

Look at each word on each card only once. When you have turned the card over do NOT go back to it again.

After all subjects had had time to look at Sample Item #2, they were told that:

'Bulk' is synonymous or means the same as 'volume'. Therefore, you simply write letter 'd' on the answer sheet blank which corresponds to Sample Item #2. Do you have any questions? (Here, time was allowed to answer any questions the subjects might have concerning the administrative procedure.)

If there were no questions or all questions were answered, the subjects were told that the test was "timed" and reminded that the test predicted their future occupational potential. Therefore, it was desirable for them to "do a good job".

All individuals assigned to either the Controlled Interrupted or Uncontrolled Interrupted groups were stopped three minutes from the time they started taking the test (i.e., they were told that their time was up and they would have to stop writing). The answer sheets for these subjects were collected at the end of this time period. A three minute limit was chosen because it allowed most subjects to complete at least

half of the test (eleven items), but prohibited anyone from completing the whole test (22 items).

All other subjects (i.e., individuals in either the Uncontrolled Complete or Controlled Complete Groups) were allowed to finish the test. When it became evident that these individuals had completed the task, they were told to "look over your work and spend time on any items which you feel need more time or effort". Any mention regarding spending more time on either the "difficult" or "easy" items was avoided. The answer sheets for these subjects were collected as soon as they had finished "re-checking" their work.

After each subject was interrupted or allowed to complete the PST, he was asked to furnish endings for fifteen phrases from the Rotter Incomplete Sentence Blank. Prior to starting, the following instructions were given to each person: "Complete these sentences to express your real feeling. Try to do every one. Be sure to make a complete sentence". The working time for this task was usually approximately 15 minutes.

When all questions on the Rotter Incomplete Sentence Blank had been answered, each individual was given the following instructions:

Now, turn your sentence completion test over and write as many of the items as you can remember from the Professional Success Test. If you think you answered the particular item correctly on the test, put a plus next to it. If you think you answered it incorrectly or got it wrong on the test, put a minus next to it. Think of as many words as you can.

Although they were not counted, when tabulating the results, the subjects were encouraged to recall the sample items. Each individual was allowed to work on this (recall) task as long as he desired beyond a two minute minimum time limit.

After each person's performance had been evaluated, three additional

group assignments were made on the basis of CPI standard score averages, comprehension scores from the Nelson-Denny Reading Test, and ACT Composite scores. Results from both of the latter two tests were obtained from university and college record files. In order to divide the sample into equal groups, boundaries or cut-off points were established at the thirty-third and sixty-sixth percentiles for each of the three separate distributions. Thus, three categories labeled Motivated to Approach Success (Ms), Mixed Motivation (M), and Motivated to Avoid Failure (Maf) were used to label individuals according to their CPI standard score averages. Individuals placed in the Ms group had attained a CPI standard score average falling above 53, those placed in the M group attained a standard score average falling between 47 and 53, while those placed in the Maf group had standard score averages which fell below 47. The subjects were also categorized into High, Medium and Low intellectual ability groups on the basis of their ACT Composite scores. The composite scores for individuals placed in the High ACT group fell above 23. Subjects placed in the Medium ACT group had scores falling between 20 and 23. The Low ACT group attained scores which fell below 20. Finally, High, Medium, and Low Reading Groups were categorized. Individuals falling in the High category scored above 48, those categorized as Medium scored between 37 and 48, while those labeled Low scored below 37.

Throughout the experiment, subject inquiries about their performance, the correctness or incorrectness of their answers, and factors related to the experimental conditions were answered by the examiner with a matter-of-fact reply such as "I can't say", or "I can't tell you that now". Classrooms at both Oklahoma State University and St. Gregory's College were used for testing.

Experimental Conditions. The first factorial arrangement of treatments consisted of three levels of the Motivational factor, motivation

to approach success (Ms), mixed motivation (M), and motivation to avoid failure (Maf); two levels of the testing factor, controlled rehearsal (CR) and uncontrolled rehearsal (UR); two levels of the interruption factor, interrupted test (IT) and completed test (CT); and three levels of the intelligence factor, High Intelligence (HI), Medium Intelligence (MI), and Low Intelligence (LI). The second factorial arrangement of treatments was identical to the first except that three levels of a Reading Comprehension factor, High Comprehension (HC), Medium Comprehension (MC), and Low Comprehension (LC), were substituted for the previously described intelligence factor.

A general description of these five factors follows:

1. Ms, M, and Maf. Whenever a subject attained a CPI standard score average which fell above the sixty-sixth percentile (i.e., a standard score average above 53) he was categorized as an individual motivated to approach success. Individuals categorized as having mixed motivation (M) attained scores falling between the sixty-sixth and thirty-third percentiles of the experimental sample (i.e., standard score averages falling between 47 and 53). The motivated to avoid failure (Maf) category included all CPI standard score averages which fell below the thirty-third percentile (i.e., standard score averages which fell below 47).

2. NR and R. All subjects in the No-Rehearsal (NR) groups were not allowed to look at any word of each item on the Professional Success Test (PST) more than once. Thus these individuals were prevented from returning to any previously attempted PST items once they had completed the task. Conversely, the subjects in the Rehearsal (R) groups were allowed to look at each word of any item as many times as they desired. They were also encouraged to "go back over the items they wanted to spend

more time on".

3. IT and CT. Individuals in the interrupted-test group (IT) were not allowed to complete the Professional Success Test. Instead, they were told to "stop" approximately three minutes after beginning the test. Subjects in the completed-test group (CT) were not stopped until they had finished the task. Both groups believed that the test was timed.

4. HI, MI, and LI. When the high intellectual ability (HI) condition was in effect, the subject had an ACT Composite score above the sixty-sixth percentile (i.e., an ACT Composite standard score above 23). Subjects categorized in the medium intellectual ability (MI) condition attained ACT Composite scores falling between the thirty-third and sixty-sixth percentiles, (i.e., a composite standard score above 20, but below 24). Finally, subjects placed in the low intellectual ability (LI) condition had earned ACT Composite scores falling below the thirty-third percentile (i.e., below 20).

5. HC, MC, and LC. Whenever a subject attained a Nelson-Denny Reading Comprehension score which fell above the sixty-sixth percentile (i.e., his score was greater than 49), he was placed in the High comprehension category. When the comprehension score fell between the thirty-third and sixty-sixth percentiles (i.e., between 37 and 48), he was placed in the Medium Comprehension (MC) category. All individuals whose comprehension scores fell below the thirty-third percentile (i.e., below 36) were categorized as Low comprehension (LC).

Dependent Measure. The principle dependent measure for this research was the difference between the number of Professional Success Test items which each subject thought he answered incorrectly (IR) and the number of items he thought he answered correctly (CR) divided by the total number of test items completed. The following formula can be used

to describe this ratio:

$$\frac{\text{IR} - \text{CR}}{\text{Total number of items completed}}$$

This ratio is referred to as the Zeigarnik Effect.

Statistical Analysis. The sample was divided into five basic categories each category having two or more levels. These categories and the corresponding levels are: (1) high, medium and low achievement motivation groups; (2) Controlled and Uncontrolled rehearsal groups; (3) interrupted and completed test groups; (4) high, medium, and low ACT groups; and (5) high, medium and low Nelson-Denny Reading Comprehension groups. Since the number of tasks completed varied between 7 and 22, the percentage of tasks of each type recalled was the appropriate measure of recall. A 3 x 3 x 2 x 2 factorial analysis of variance was made on the first four groups resulting from the above categorization, i.e., the motivation, rehearsal, interrupted test and ACT categories. A second 3 x 3 x 2 x 2 factorial analysis of variance was made on groups 1, 2, 3, and 5, i.e., the motivation, rehearsal, interrupted test and reading comprehension categories. Thus, the first factorial analysis of variance incorporated the ACT category, while the second analysis included the reading comprehension category. To correct for unequal cell frequencies, the Unweighted Means Procedure described by Weiner (1962, pp. 241-244) was also utilized in the data analysis. With this exception, both analyses were identical.

## CHAPTER V

### RESULTS AND SUMMARY OF FINDINGS

#### Results

The raw data used in the analysis are presented in Appendix E. The mean number of items recalled from the Professional Success Test for the Motivation, Rehearsal, Interruption, and Intelligence factors are presented in Table VIII. The results of the statistical analysis of variance for the same variables are presented in Table IX.

Table IX shows that statistically significant treatment effects were found for the Interruption factor (C). The Rehearsal by Interruption (BC) and Rehearsal by Intelligence (BD) interactions were also significant. The Intelligence factor (D) and the Motivation by Rehearsal interaction (AB) approached significance at the .05 level. Table VIII shows that the Interrupted-Test Group had the highest number of recalled incorrect items (-.0427 mean items) while the Completed-Test Group recalled fewer incorrect items (-.0195 mean items). This difference was significant at the .05 level of confidence. The Table also shows that the High Intelligence group recalled more test items (-.0473 mean items) than either the Medium (-.0230 mean items) or the Low (-.0230 mean items) Intelligence groups.

The significant Rehearsal by Interruption and Rehearsal by Intelligence interactions require special attention. The mean number of items recalled for the two Rehearsal conditions over two levels of the Interruption factor are plotted in Figure 1. Inspection of the Rehearsal by



TABLE VIII

THE MEAN NUMBER OF ITEMS RECALLED FROM THE PROFESSIONAL SUCCESS TEST  
USING ACT COMPOSITE TEST SCORES

Main Effects

Ms	M	Maf	No Reh.	Reh.	Interr.	Comp.	H-Act	M-Act	L-Act
-.0388	-.0303	-.0243	-.0368	-.0255	-.0427	-.0195	-.0473	-.0230	-.0230
N = 70	N = 55	N = 86	N = 103	N = 108	N = 104	N = 107	N = 61	N = 65	N = 85

Treatment Combinations

		H - Act		M - Act		L - Act		
Ms	No	C	N=3	-.0667	N=5	-.0600	N=7	-.0857
	Rehearsal	I	N=6	-.0167	N=7	0.0	N=4	0.0
	Rehearsal	C	N=5	-.1000	N=10	-.0800	N=4	.0250
		I	N=8	-.0750	N=5	-.0400	N=6	0.0
M	No	C	N=3	-.0333	N=4	-.0750	N=6	-.1167
	Rehearsal	I	N=6	-.0333	N=3	-.0333	N=6	-.0167
	Rehearsal	C	N=3	-.0667	N=3	-.1000	N=4	0.0
		I	N=7	-.0714	N=4	0.0	N=6	-.0167
Maf	No	C	N=6	-.0333	N=5	-.0600	N=12	-.0167
	Rehearsal	I	N=5	-.0200	N=9	-.0111	N=6	-.0167
	Rehearsal	C	N=5	-.0600	N=6	-.0167	N=13	-.0231
		I	N=4	-.0250	N=4	0.0	N=11	-.0091

TABLE IX

ANALYSIS OF VARIANCE FOR THE MOTIVATION, REHEARSAL  
INTERRUPTION AND INTELLIGENCE FACTORS

Source	df	SS	Ms	F
A	2	.017720	.008860	1.775
B	1	.0069531	.006954	1.393
C	1	.0293534	.0293533	5.88126**
D	2	.0286955	.0143477	2.874*
AB	2	.0286240	.0143150	2.868*
AC	2	.0157469	.0078736	1.577
AD	4	.0285695	.0071423	1.493
BC	1	.0339370	.0339397	6.800***
BD	2	.0665842	.0332904	6.670***
ABC	2	.0191565	.0095757	1.919
ABD	4	.0258876	.0064719	1.297
ACD	4	.0187920	.0046968	.941
BCD	2	.0089710	.0044844	.898
ABCD	4	.0160470	.0040111	.804
ERROR	175	.0873414	.0004991	
TOTAL	35	3.557991		

\* = Significance at the .10 level  
 \*\* = Significance at the .05 level  
 \*\*\* = Significance at the .01 level

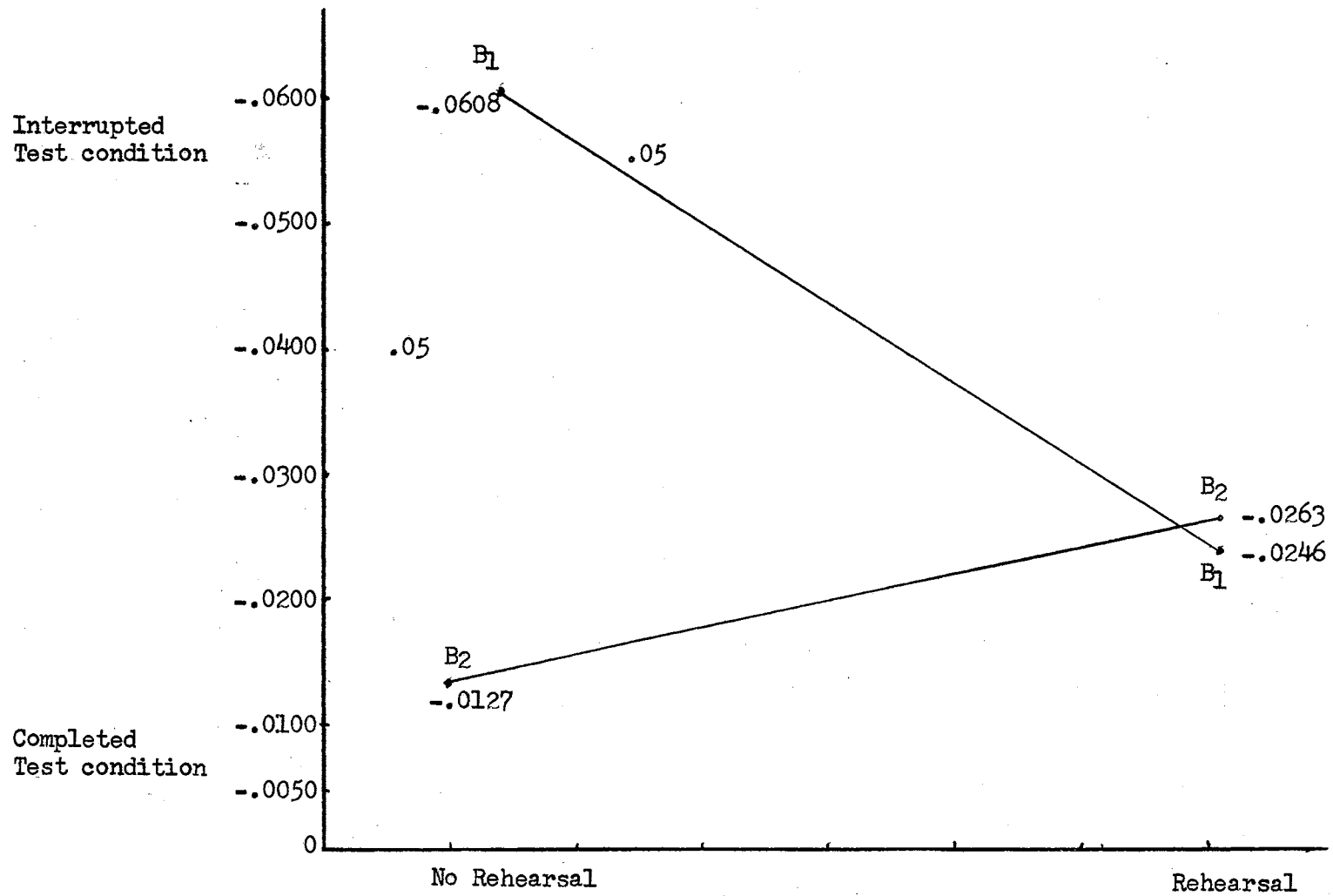


Figure 1. The B C Interaction for the Mean Recalled Professional Success Test Items

Interruption segment of Figure 1 indicates that in going from the No-Rehearsal to the Rehearsal level the overall effects of the Interrupted-Test condition tend to be pulled down, whereas the Completed-Test effect increases. Application of the least significant difference (lsd) test criterion described by Steele and Torrie (1960) indicates that the increase in performance for the Completed-Test condition was not statistically significant ( $P < .05$ ). The decrease in performance for the Interrupted-Test condition, however, was significant ( $P < .05$ ). A similar lsd test was made on performance changes for the rehearsal factor going across the two levels of the Interruption factor. The difference in the effects of the Interrupted and Completed-Test factors were found to be significant at the No-Rehearsal level ( $P < .05$ ). The difference at the Rehearsal level was not significant ( $P > .05$ ).

Inspection of Figure 2 showing the Rehearsal by Intelligence interaction indicates that in going from the High to Low Intelligence level the overall effects of the Rehearsal condition tend to be pulled down. An opposite tendency was shown for the No-Rehearsal condition. Least Significant Difference Tests indicate that the increase in performance for the No-Rehearsal condition was not statistically significant ( $P > .05$ ). The decrease in performance for the Rehearsal condition was statistically significant ( $P < .05$ ) between the High and Medium Intelligence levels but not between the Medium and Low Levels ( $P > .05$ ). Tests made on the Rehearsal factor going across three levels of Intelligence showed statistically significant differences at the High Intelligence level ( $P < .05$ ), the Medium Intelligence level ( $P < .05$ ), and the Low Intelligence level ( $P < .05$ ).

The Motivation by Rehearsal interaction (AB) showed a strong tendency toward significance even though it was not statistically

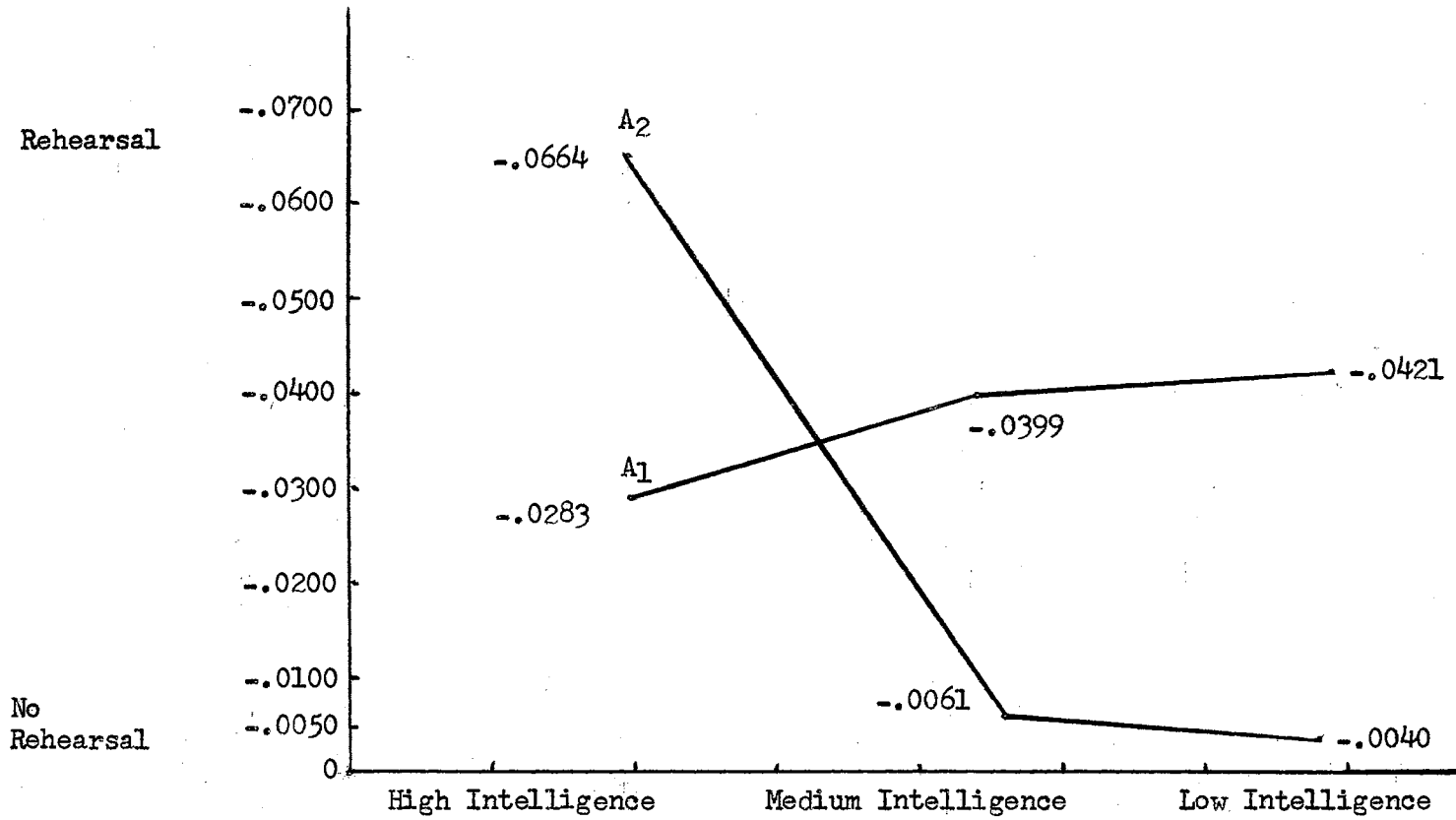


Figure 2. The Rehearsal by Intelligence (B D) Interaction for the Recalled Professional Success Test Items

significant. As seen in Figure 3, the mean number of items recalled for the No Rehearsal condition decreased between the highest two levels of the Motivation condition, but increased for the lowest motivational level. The Rehearsal condition showed an opposite trend by increasing between the two highest motivational levels, but decreasing for the lowest level.

The mean number of items recalled from the Professional Success Test for the Motivation, Rehearsal, Interruption, and Reading factors are presented in Table X. The analysis of variance for these factors is presented in Table XI. Table XI indicates that statistically significant treatment effects were found for the Interruption factor (C'). The Motivation by Rehearsal (AB'), Rehearsal by Interruption (BC'), and Rehearsal by Reading (BD') interactions were also significant. The Reading factor (C') and the Motivation by Reading (AD') interaction showed a strong tendency to approach significance. Table X shows that the Interrupted-Test group recalled more incorrect items from the Professional Success Test (-.0410 mean items) than the Completed-Test group (-.0193 mean items). This difference was significant at the .05 level of confidence. It might also be noted that the High Reading Comprehension group recalled more incorrect test items (-.0447 mean items) than both the Medium (-.0147 mean items) and the Low (-.0310 mean items) Reading groups.

The significant Motivation by Rehearsal interaction (AB') is plotted in Figure 4. Figure 4 indicates that the overall effects of the Rehearsal-Test condition tend to decrease between the High and Medium Motivation conditions, but increase between the Medium and Low Motivation conditions. A somewhat opposite trend is indicated by the No-Rehearsal-Test condition which increases between the High and Medium Motivation

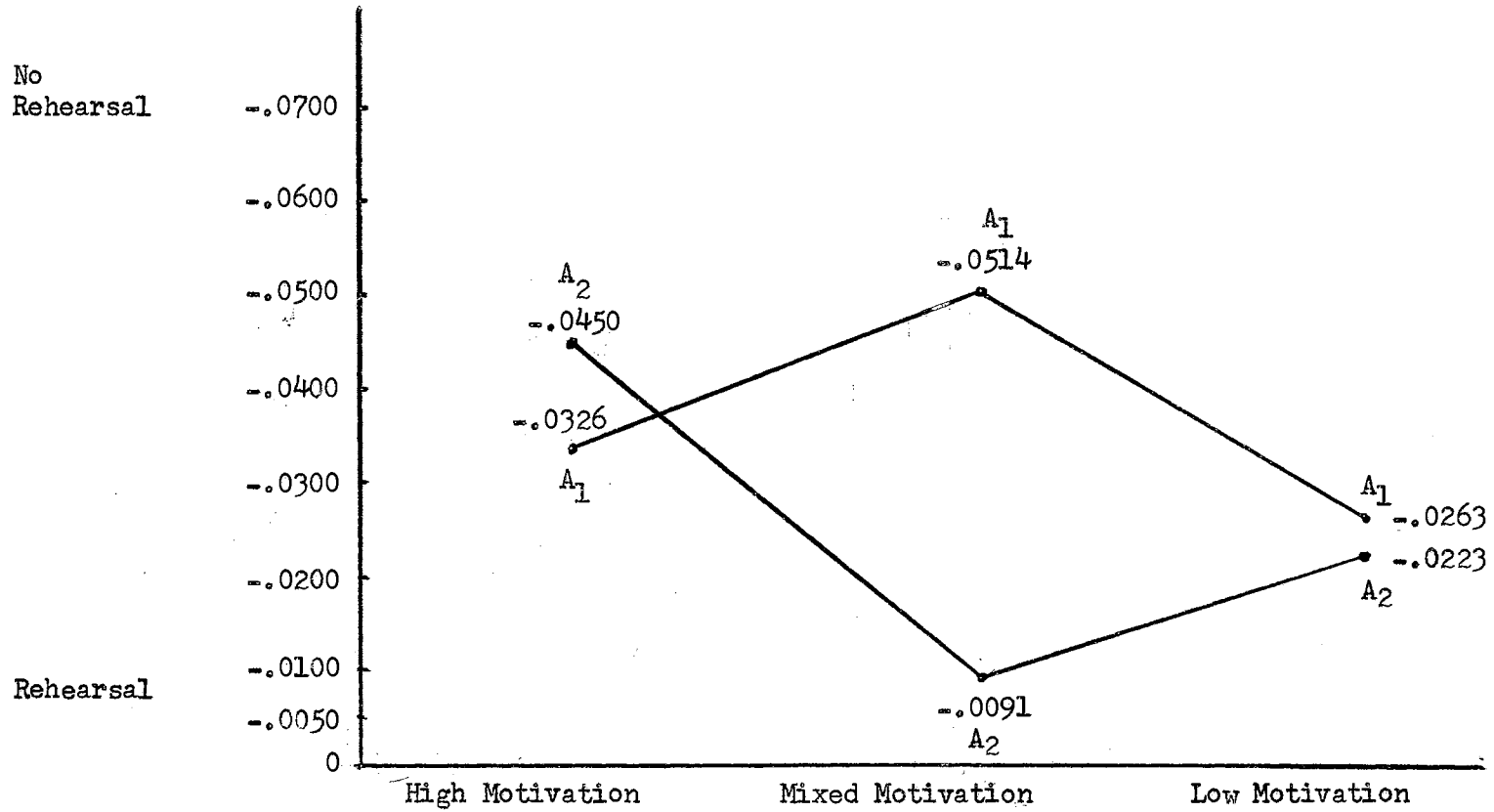


Figure 3. The Rehearsal by Motivation (A B) Interaction for the Mean Recalled Professional Success Test Items

TABLE X

THE MEAN NUMBER OF ITEMS RECALLED FROM THE PROFESSIONAL SUCCESS TEST  
USING READING COMPREHENSION SCORES

Main Effects

Ms	M	Maf	No Reh.	Reh.	Interr.	Comp.	H. Read	M Read	L Read
-.0428	-.0275	-.0202	-.0363	-.0241	-.0410	-.0193	-.0447	-.0147	-.0310
N = 70	N = 55	N = 86	N = 103	N = 108	N = 107	N = 104	N = 75	N = 72	N = 64

Treatment Combinations

		High Read. Comp.		Medium Read. Comp.		Low Read. Comp.		
Ms	No	C	N=4	-.0500	N=6	-.0667	N=5	-.1000
	Rehearsal	I	N=7	-.0143	N=6	0.0	N=4	0.0
	Rehearsal	C	N=11	-.0636	N=5	-.0600	N=3	-.0667
		I	N=7	-.0714	N=8	-.0250	N=4	-.0250
M	No	C	N=4	-.0750	N=3	-.0667	N=6	-.1000
	Rehearsal	I	N=6	-.0333	N=6	-.0167	N=3	-.0333
	Rehearsal	C	N=3	-.0667	N=2	.1500	N=5	0.0
		I	N=7	-.0714	N=4	0.0	N=6	-.0167
Maf	No	C	N=5	-.0200	N=5	-.0400	N=13	-.0308
	Rehearsal	I	N=9	-.0222	N=8	-.0125	N=3	0.0
	Rehearsal	C	N=7	-.0571	N=12	-.0250	N=5	0.0
		I	N=5	-.0200	N=7	-.0143	N=7	0.0



TABLE XI

ANALYSIS OF VARIANCE FOR THE MOTIVATION, REHEARSAL  
INTERRUPTION AND READING FACTORS

Source	de	SS	Ms	F
A'	2	.015892	.007945	1.515
B'	1	.006643	.006641	1.266
C'	1	.020961	.020959	3.996**
D'	2	.026676	.013336	2.543*
AB'	2	.040526	.020263	3.863**
AC'	2	.020585	.010292	1.962
AD'	4	.042863	.010717	2.043*
BC'	1	.034339	.034339	6.547**
BD'	2	.035874	.017936	3.420**
ABC'	2	.021292	.010648	2.030
ABD'	4	.017709	.004427	.844
ACD'	4	.014718	.003676	.701
BCD'	2	.005921	.002960	.564
ABCD'	4	.014396	.003397	.648
ERROR	35	.917809	.005245	
TOTAL	175	3.252621		

\* = Significance at the .10 level  
 \*\* = Significance at the .05 level  
 \*\*\* = Significance at the .01 level

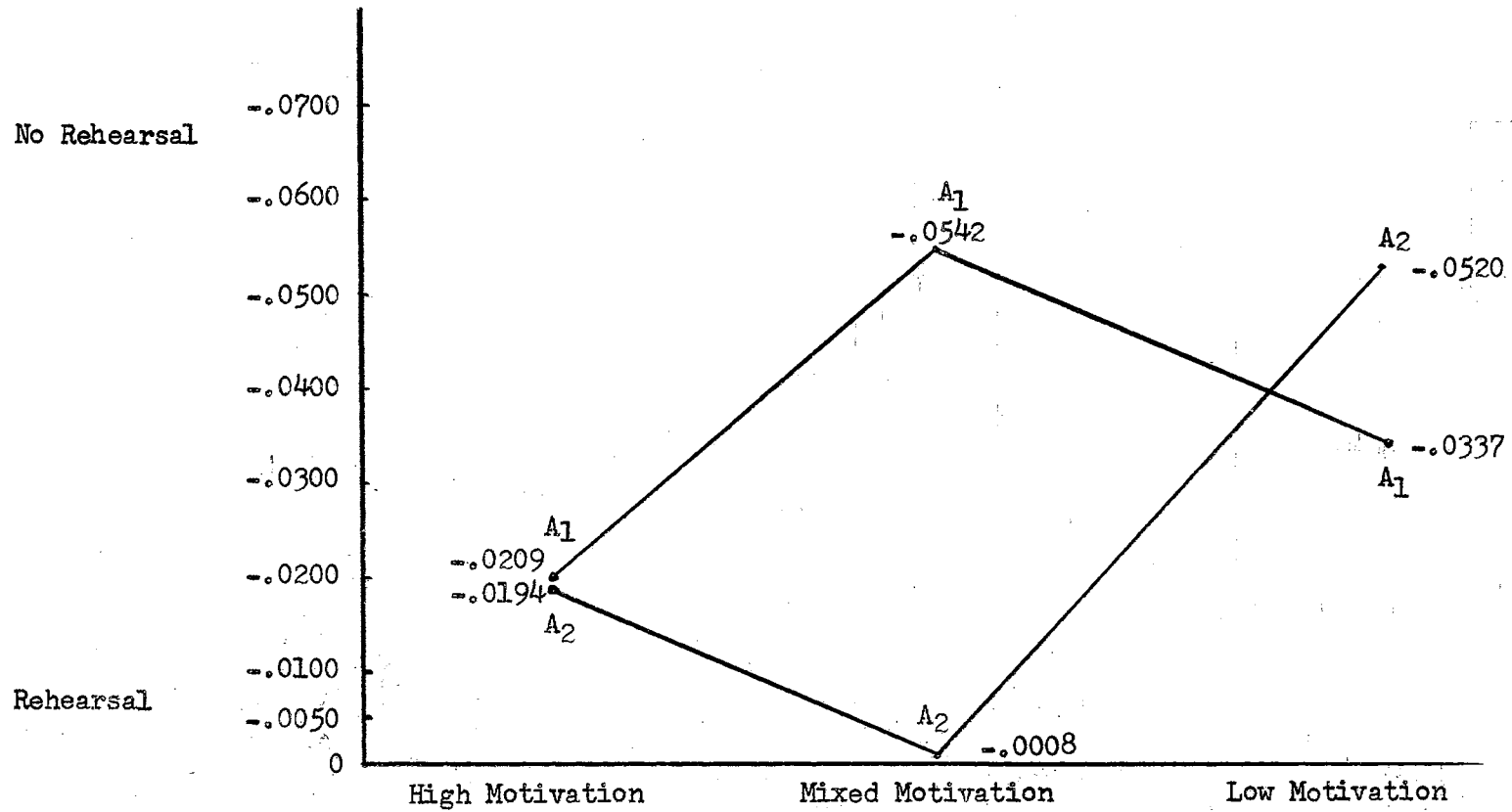


Figure 4. The Rehearsal by Motivation (A B\*) Interaction for the Mean Recalled Professional Success Test Items

condition, but decreases between the Medium and Low conditions. Tests for lsd revealed that neither the increase nor the decrease in performance for the No-Rehearsal-Test group between the various Motivation conditions was statistically significant ( $P > .05$ ). Conversely, both the decrease and increase in performance for the Rehearsal group were statistically significant ( $P < .05$ ). Similar lsd tests made on the performance changes for the Rehearsal factors going across three levels of the Motivation Condition revealed that only the difference in the mean number of items recalled by the Medium Motivation group was statistically significant ( $P < .05$ ).

Figure 5 shows the significant Rehearsal by Interruption interaction (BC') for the Reading Analysis of Variance. Figure 5 indicates that the overall effects of the Interrupted-Test condition tend to decrease between the No-Rehearsal and Rehearsed-Test conditions. Conversely, the Completed-Test condition tends to increase between these conditions. Application of the lsd test indicates that the decrease in the Interrupted condition between the No-Rehearsal and the Rehearsal conditions was statistically significant ( $P < .05$ ), while the increase in the Completed-Test condition between the No-Rehearsal and Rehearsal conditions was not statistically significant ( $P > .05$ ). The lsd tests made on the Interrupted-Test factor going across two levels of the Rehearsal condition indicate that the difference in the mean number of items recalled by the Interrupted-Test group under the No-Rehearsal condition was statistically greater than the mean number of items recalled by the Completed-Test group under the same condition ( $P < .05$ ). The difference between the mean number of items recalled by the Interrupted and Completed-Test groups under the Rehearsal condition was not statistically significant.

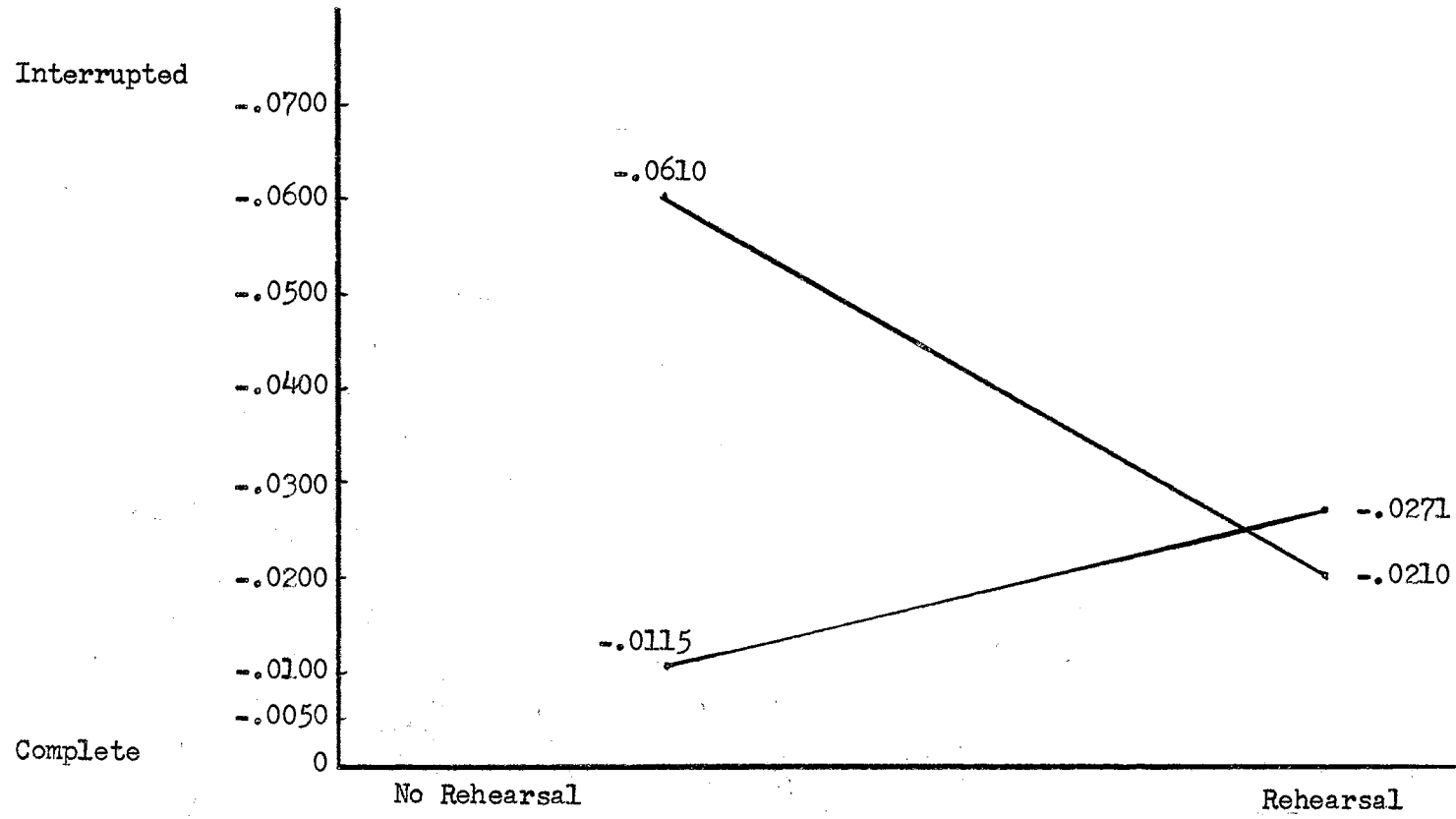


Figure 5. The Rehearsal by Interruption (B C') Interaction for the Mean Recalled Professional Success Test Items

The significant Rehearsal by Reading interaction ( $BD'$ ) is plotted in Figure 6. Inspection of Figure 6 reveals that the overall effects of the Rehearsed-Test condition decrease between the High and Medium Reading conditions but increase between the Medium and Low Reading conditions. A more consistent trend is exhibited by the No-Rehearsal condition which shows a gradual increase over the High, Medium, and Low Reading conditions. Application of the lsd test reveals that none of the differences between the mean number of items recalled by the No-Rehearsal group at any of the reading levels was statistically significant. However, the number of test items recalled by the Rehearsed-Test group was significantly greater under the High Reading condition than under the Medium Reading condition ( $P < .05$ ). The difference between the mean number of items recalled by the Rehearsal group under the Medium and Low Reading conditions, however, was not significant. The lsd tests made on performance changes for the differences in the effects of the Rehearsal factor going across three levels of the Reading condition indicate that the Rehearsal group recalled significantly more test items at the Medium Reading level than the No-Rehearsal group, ( $P < .05$ ). The mean differences in recall between Rehearsal groups at all other levels of Reading were not statistically significant.

Finally, the Rehearsal by Reading ( $AD'$ ) interaction approached statistical significance at the .05 level. This interaction is plotted in Figure 7. Reference to Figure 7 reveals that the High Motivation Condition ( $M_S$ ) increased slightly between the High and Medium levels of the Reading condition, but showed considerable decrease between the Medium and Low Reading condition levels. The mixed ( $M$ ) motivation condition showed an opposite effect, i.e., an initial decrease between the High and Medium Reading condition levels but an increase between the

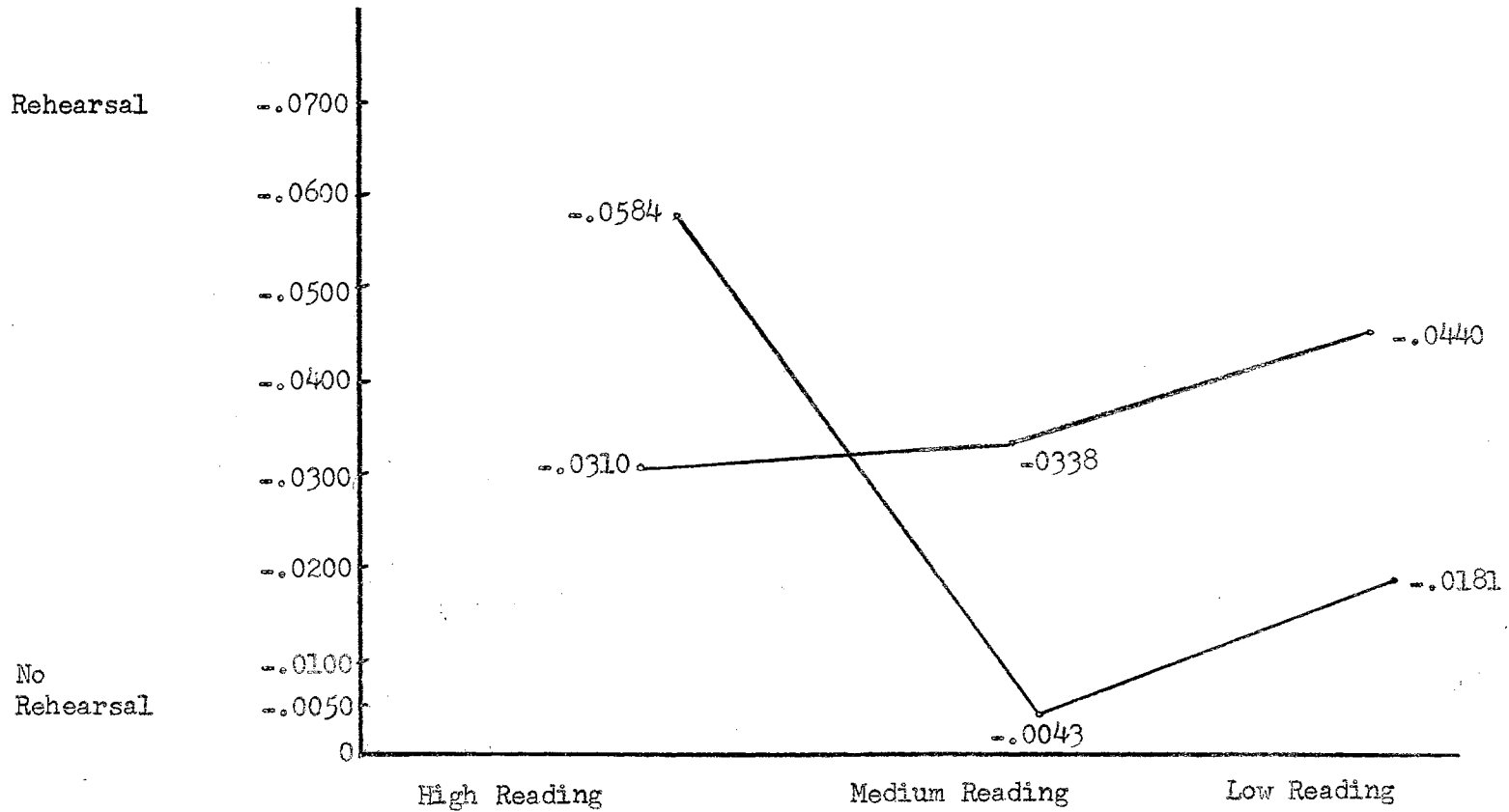


Figure 6. The Rehearsal by Reading (B D<sup>9</sup>) Interaction for the Mean Recalled Professional Success Test Items

High  
Motivation

Medium  
Motivation

Low  
Motivation

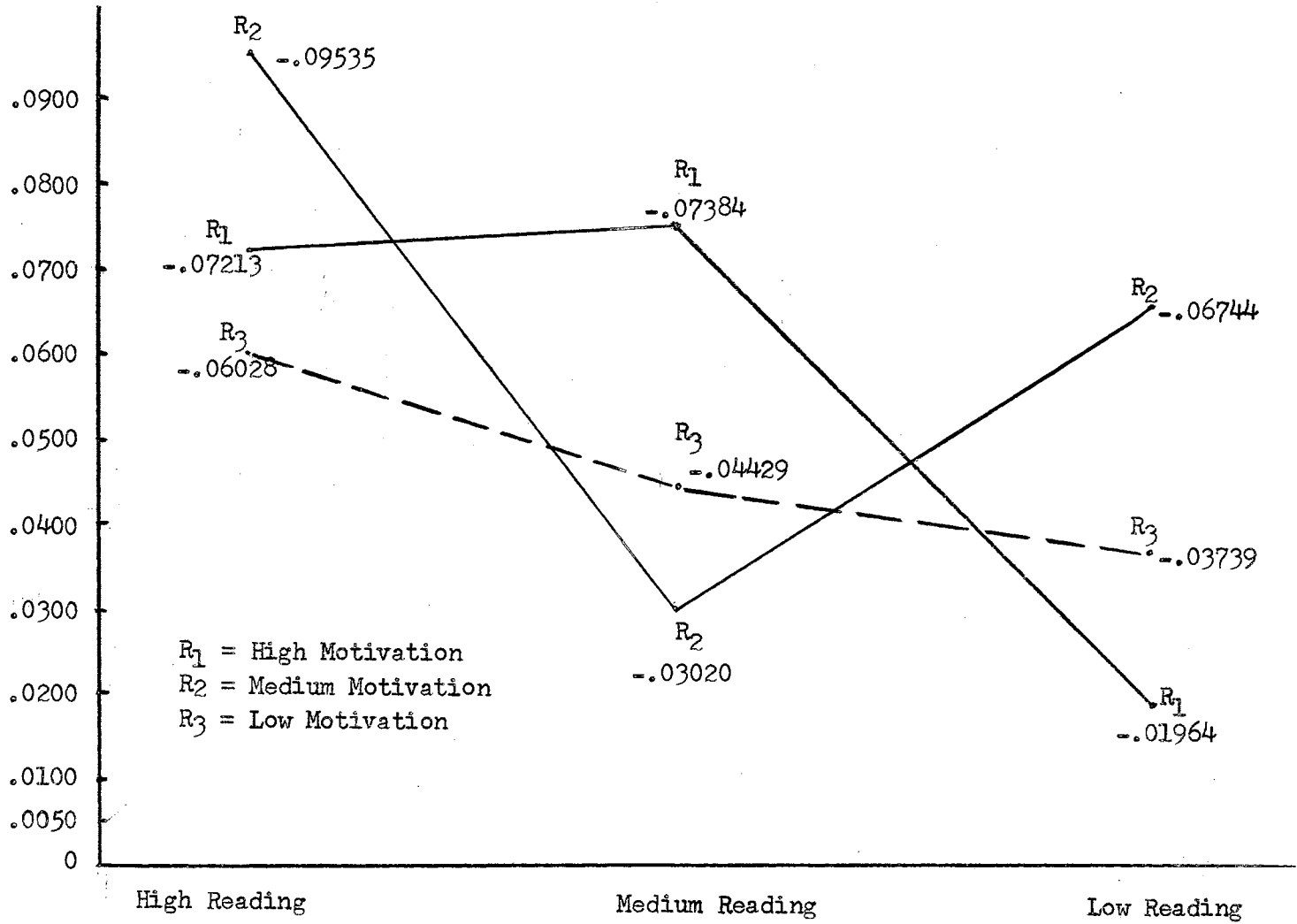


Figure 7. The Motivation by Reading (A D') Interaction for the Mean Recalled Professional Success Test Items

Medium and High Reading Conditions. The Low Motivation ( $M_{af}$ ) group decreased slightly across all levels of the Reading condition.

### Discussion

The first hypothesis, which predicted no significant difference between High and Low achievement motivation scorers and the differential recall of incompleting and completed items after an interrupted objective examination was verified. Individuals obtaining High achievement motivation scores ( $M_s$ ) on the Dominance, Capacity for Status, Sociability, Social Presence, and Self-acceptance scales of the California Psychological Inventory (CPI) did not differ in their recall of items on the Professional Success Test from Mixed ( $M$ ) or Low ( $M_{af}$ ) achievement motivation scorers. These results appear to contradict the validation evidence presented by Carney, Mann, and McCormick (1966) for the CPI as a measure of achievement motivation. It should be noted, however, that these investigators state that the magnitude of their experimental effect on the CPI was small (approximately one-third the size) compared to that obtained with the standard TAT measure. Thus, the reduced sensitivity of the CPI measure of achievement motivation is a logical explanation for the absence of differential item recall between the various achievement groups.

The second hypothesis predicted no significant difference between High and Low achievement motivation and incompleting-completing item recall after an objective examination providing limited access to previously attempted questions. Partial evidence for the rejection of this hypothesis was obtained from the finding that individuals not allowed to return to previously completed test items recalled significantly (at the .05 level) more items when they were interrupted on the test than when they were allowed to complete it. This finding is consistent with



results obtained by Weiner, Johnson, and Mehrobian (1968). However, it was also found that the tendency of the No-Rehearsal-Interrupted Test group to recall more items decreased significantly (at the .05 level) under conditions allowing rehearsal. Thus, it appears that the Zeigarnik Effect is most potent under conditions in which the individual is interrupted at a task and not allowed to return to it. These same results tend to oppose the contention by Weiner (1966b) that the Zeigarnik Effect is attributable to differential learning, i.e., that subjects High in achievement motivation learn the incompleting tasks to a greater extent than the completed tasks. Rather than rehearsing and recalling more test items, individuals in the Rehearsal group recalled fewer words, a trend opposite to that expected to result from differential rehearsal. In explanation of these conflicting results, Atkinson's study (1953) suggests the possibility that the No-Rehearsal condition was perceived as more difficult and consequently more stress producing than the Rehearsal condition. This perceived stress, in turn, may have modified the resulting Zeigarnik Effect.

The third hypothesis predicted no significant degree of relationship between incompleting-completing test item recall after an objective examination and scores on either the American College Test (ACT) or the Comprehension Scale of the Nelson-Denny Reading Test. This hypothesis was accepted. However, the significant Rehearsal by Intelligence interaction indicates that individuals attaining High Intelligence (ACT) scores recalled significantly more test items (at the .05 level) under the Rehearsal condition than under the No-Rehearsal condition. Opposite results were obtained for individuals attaining Low and Medium Intelligence scores. These subjects recalled more items when they were not given an opportunity to "re-check" their test. They recalled

significantly fewer items (at the .05 level of confidence) when given the opportunity to "re-check" their work. A similar pattern of findings was indicated by the significant Rehearsal by Reading interaction. Both of these interactions appear to indicate that individuals attaining High Intelligence and Reading comprehension scores recall more test items when given the opportunity to "re-check" the test or rehearse the items they consider most difficult. Conversely, individuals attaining medium and low scores in these areas recall more items when not allowed to re-check or rehearse. Thus, both intelligence and reading comprehension appear to influence the number of items recalled (i.e., the Zeigarnik Effect) after interruption on an objective examination.

The primary goal of this research was to determine empirically how certain personality factors or human traits effect human behavior in an objective examination situation. In summation, therefore, the findings indicate that both reading comprehension and intelligence are factors which influence examination performance. Individuals High in Intelligence and Reading comprehension ability appear to gain most from "re-checking" examination items since they recalled significantly more items (at the .05 level of confidence) than either the Medium or Low scoring groups. For individuals attaining Medium or Low Intelligence and Reading scores, the reverse appears to be true, i.e., these individuals do not benefit from "re-checking" their test papers. Theoretically, it appears that the Zeigarnik Effect is most pronounced when High achievement scoring subjects are not allowed to rehearse or "re-check" their test items. These results tend to oppose the contention that the Zeigarnik Effect is attributable to differential learning and support the position that the recall of interrupted test items appears to occur as a result of a thwarted general tendency to attain a goal, i.e., a tension

producing situation. The results also indicate that the differential learning position is most applicable for subjects attaining Mixed and Low achievement motivation scores. Finally, it might be noted that the Dominance, Capacity for Status, Sociability, Social Presence, and Self-acceptance scales of the California Psychological Inventory are considerably less sensitive as a measure of achievement motivation than the standard TAT procedure.

Future research with the effects of these variables on examination performance should either utilize the standard TAT method of measuring achievement motivation or validate a more sensitive objective measure of this factor. In addition, the specific influence of both intelligence and comprehension on the Zeigarnik Effect might be investigated. Special emphasis might also be placed on obtaining both a verbal and nonverbal measure of intelligence in order to increase the validity of this factor.

#### Summary

It was the primary purpose of this research to systematically investigate several factors which influence the Zeigarnik Effect, (i.e., the recall of an interrupted task) in an objective examination situation. The effect of certain personality factors such as motivation and intelligence on examination performance was also investigated. To facilitate the study statistically, three levels of achievement motivation, a No Rehearsal-Rehearsal test condition, a completed-interrupted test condition, three levels of an Intelligence condition, and three levels of a Reading comprehension condition were analyzed in two separate  $2 \times 2 \times 3 \times 3$  factorial analyses of variance. The dependent variable was the number of objective examination items each subject recalled after either being interrupted or allowed to complete the examination.

A total of 211 freshmen college male volunteers were randomly assigned to one of the four basic treatment groups (i.e., Uncontrolled Complete, Uncontrolled Interrupted, Controlled Complete, or Controlled Interrupted). Each individual was then asked to complete the California Psychological Inventory (CPI), the Professional Success Test (PST) (an instrument especially designed for the experiment), and the Rotter Incomplete Sentence Blank. Prior to being released from the experiment, each individual was asked to list as many of the word's from the PST as possible and to mark those he thought he answered correctly on the test with a plus and those he thought were answered incorrectly on the test with a minus. After each person's performance had been evaluated, three additional group assignments were made on the basis of CPI standard score averages, comprehension scores from the Nelson-Denny Reading Test, and the ACT Composite scores.

The major findings were as follows:

1. Individuals obtaining High achievement motivation scores (Ms) on the Dominance, Capacity for Status, Sociability, Social Presence, and Self-acceptance scales of the (CPI) did not differ in their recall of objective test items from Mixed (M) or Low (Maf) achievement motivation scorers. This finding appears to result from the reduced sensitivity of the CPI as an objective measure of achievement motivation.
2. Individuals not allowed to return to previously completed test questions recalled significantly more items when they were interrupted on the test than when they were allowed to complete the test. Subjects interrupted on the test but allowed time to "re-check" their previously attempted work recalled significantly fewer items than individuals interrupted and not given time to "re-check" their work.
3. It was found that individuals attaining High Intelligence test

scores recalled significantly more test items under the Rehearsal condition than under the No-Rehearsal condition. Conversely, Medium and Low Intelligence test scorers recalled more items when they were not given an opportunity to "re-check" their work. A similar pattern of findings was found for the Reading factor, i.e., High Reading scorers recalled more items under the No-Rehearsal condition while individuals attaining Medium and Low Reading scorers recalled more items under the Rehearsal condition.

Generally, it can be concluded that both Intelligence and Reading comprehension affect the Zeigarnik Effect, i.e., the number of items recalled after task interruption. Secondly, subjects interrupted at a task and not kept in a state of tension (i.e., allowed to return to previously attempted items) exhibit a significantly smaller Zeigarnik Effect than individuals interrupted at a task and kept in a state of tension (not allowed to return to previously attempted items). Thus, the Zeigarnik Effect appears to be a function of tension rather than differential rehearsal. Finally, the Dominance, Capacity for Status, Sociability, Social Presence, and Self-acceptance Scales of the California Psychological Inventory do not appear to be a very sensitive objective measure of achievement motivation.

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A P P E N D I C E S

APPENDIX A

## California Psychological Inventory

1. I enjoy social gatherings just to be with people.
2. The only interesting part of the newspaper is the "funnies."
3. I looked up to my father as an ideal man.
4. A person needs to "show off" a little now and then.
5. Our thinking would be a lot better off if we would just forget about words like "probably," "approximately," and "perhaps."
6. I have a very strong desire to be a success in the world.
7. When in a group of people I usually do what the others want rather than make suggestions.
8. I liked "Alice in Wonderland" by Lewis Carroll.
9. I usually go to the movies more than once a week.
10. Some people exaggerate their troubles in order to get sympathy.
11. People can pretty easily change me even though I thought that my mind was already made up on a subject.
12. I often feel that I made a wrong choice in my occupation.
13. I am very slow in making up my mind.
14. I always follow the rule: business before pleasure.
15. Several times a week I feel as if something dreadful is about to happen.
16. There's no use in doing things for people; you only find that you get it in the neck in the long run.
17. I would like to be a journalist.
18. A person who doesn't vote is not a good citizen.
19. I think I would like the work of a building contractor.
20. I have had very peculiar and strange experiences.
21. My daily life is full of things that keep me interested.
22. When a person "pads" his income tax report so as to get out of some of his taxes, it is just as bad as stealing money from the government.
23. In most ways the poor man is better off than the rich man.
24. I always like to keep my things neat and tidy and in good order.
25. Clever, sarcastic people make me feel very uncomfortable.
26. It's a good thing to know people in the right places so you can get traffic tags, and such things, taken care of.
27. It makes me feel like a failure when I hear of the success of someone I know well.
28. I think I would like the work of a dress designer.
29. I am often said to be hotheaded.
30. I gossip a little at times.
31. I doubt whether I would make a good leader.
32. I tend to be on my guard with people who are somewhat more friendly than I had expected.
33. Usually I would prefer to work with women.
34. There are a few people who just cannot be trusted.
35. I become quite irritated when I see someone spit on the sidewalk.
36. When I was going to school I played hooky quite often.
37. I have very few fears compared to my friends.
38. It is hard for me to start a conversation with strangers.
39. I must admit that I enjoy playing practical jokes on people.
40. I get very nervous if I think that someone is watching me.
41. For most questions there is just one right answer, once a person is able to get all the facts.

42. I sometimes pretend to know more than I really do.
43. It's no use worrying my head about public affairs; I can't do anything about them anyhow.
44. Sometimes I feel like smashing things.
45. As a child I used to be able to go to my parents with my problems.
46. I think I would like the work of a school teacher.
47. Women should not be allowed to drink in cocktail bars.
48. Most people would tell a lie if they could gain by it.
49. When someone does me a wrong I feel I should pay him back if I can, just for the principle of the thing.
50. I seem to be about as capable and smart as most others around me.
51. Every family owes it to the city to keep their sidewalks cleared in the winter and their lawn mowed in the summer.
52. I usually take an active part in the entertainment at parties.
53. I think I would enjoy having authority over other people.
54. I find it hard to keep my mind on a task or job.
55. Some of my family have quick tempers.
56. I hate to be interrupted when I am working on something.
57. I have sometimes stayed away from another person because I feared doing or saying something that I might regret afterwards.
58. I get very tense and anxious when I think other people are disapproving of me.
59. The trouble with many people is that they don't take things seriously enough.
60. I have often met people who were supposed to be experts who were no better than I.
61. I liked school.
62. I think Lincoln was greater than Washington.
63. It is always a good thing to be frank.
64. A windstorm terrifies me.
65. I think I would like the work of a clerk in a large department store.
66. Sometimes I feel like swearing.
67. I feel sure that there is only one true religion.
68. I am embarrassed by dirty stories.
69. I would disapprove of anyone's drinking to the point of intoxication at a party.
70. Sometimes I cross the street just to avoid meeting someone.
71. I get excited very easily.
72. I used to keep a diary.
73. Maybe some minority groups do get rough treatment, but it's no business of mine.
74. It is very hard for me to tell anyone about myself.
75. We ought to worry about our own country and let the rest of the world take care of itself.
76. I often feel as if the world was just passing me by.
77. When I get bored I like to stir up some excitement.
78. I like to boast about my achievements every now and then.
79. I am afraid of deep water.
80. There have been times when I have been very angry.
81. I must admit I often try to get my own way regardless of what others may want.
82. I think I would like the work of a garage mechanic.
83. I usually feel nervous and ill at ease at a formal dance or party.
84. I have at one time or another in my life tried my hand at writing poetry.
85. I don't like to undertake any project unless I have a pretty good idea as to how it will turn out.

86. Most of the arguments or quarrels I get into are over matters of principle.
87. I like adventure stories better than romantic stories.
88. I do not like to see people carelessly dressed.
89. Once a week or oftener I feel suddenly hot all over, without apparent cause.
90. As long as a person votes every four years, he has done his duty as a citizen.
91. Sometimes I think of things too bad to talk about.
92. People often expect too much of me.
93. I would do almost anything on a dare.
94. With things going as they are, it's pretty hard to keep up hope of amounting to something.
95. The idea of doing research appeals to me.
96. I take a rather serious attitude toward ethical and moral issues.
97. I would like the job of a foreign correspondent for a newspaper.
98. People today have forgotten how to feel properly ashamed of themselves.
99. I cannot keep my mind on one thing.
100. I prefer a shower to a bathtub.
101. I must admit that I often do as little work as I can get by with.
102. I like to be the center of attention.
103. I like to listen to symphony orchestra concerts on the radio.
104. I would like to see a bullfight in Spain.
105. I am fascinated by fire.
106. The average person is not able to appreciate art and music very well.
107. I can be friendly with people who do things which I consider wrong.
108. I have no dread of going into a room by myself where other people have already gathered and are talking.
109. I get pretty discouraged sometimes.
110. The thought of being in an automobile accident is very frightening to me.
111. When in a group of people I have trouble thinking of the right things to talk about.
112. I set a high standard for myself and I feel others should do the same.
113. School teachers complain a lot about their pay, but it seems to me that they get as much as they deserve.
114. At times I feel like picking a fist fight with someone.
115. Sometimes I have the same dream over and over.
116. It is annoying to listen to a lecturer who cannot seem to make up his mind as to what he really believes.
117. I don't blame anyone for trying to grab all he can get in this world.
118. I believe we are made better by the trials and hardships of life.
119. Planning one's activities in advance is very likely to take most of the fun out of life.
120. I do not always tell the truth.
121. I was a slow learner in school.
122. I like poetry.
123. I think I am stricter about right and wrong than most people.
124. I am likely not to speak to people until they speak to me.
125. There is something wrong with a person who can't take orders without getting angry or resentful.
126. I do not dread seeing a doctor about a sickness or injury.
127. I always try to consider the other fellow's feelings before I do something.
128. It takes a lot of argument to convince most people of the truth.
129. I think I would like to drive a racing car.
130. Sometimes without any reason or even when things are going wrong I feel excitedly happy, "on top of the world."

131. One of my aims in life is to accomplish something that would make my mother proud of me.
132. I fall in and out of love rather easily.
133. I feel as good now as I ever have.
134. It makes me uncomfortable to put on a stunt at a party even when others are doing the same sort of thing.
135. I wake up fresh and rested most mornings.
136. Most people make friends because friends are likely to be useful to them.
137. I wish I were not bothered by thoughts about sex.
138. I seldom or never have dizzy spells.
139. It is all right to get around the law if you don't actually break it.
140. I enjoy hearing lectures on world affairs.
141. Parents are much too easy on their children nowadays.
142. Most people will use somewhat unfair means to gain profit or an advantage rather than to lose it.
143. I like to be with a crowd who play jokes on one another.
144. I am somewhat afraid of the dark.
145. I have a tendency to give up easily when I meet difficult problems.
146. I would like to wear expensive clothes.
147. I certainly feel useless at times.
148. I believe women should have as much sexual freedom as men.
149. I consider a matter from every standpoint before I make a decision.
150. Criticism or scolding makes me very uncomfortable.
151. I have strange and peculiar thoughts.
152. I read at least ten books a year.
153. If I am not feeling well I am somewhat cross and grouchy.
154. I like tall women.
155. A person should adapt his ideas and his behavior to the group that happens to be with him at the time.
156. I hardly ever get excited or thrilled.
157. I have the wanderlust and am never happy unless I am roaming or traveling about.
158. I frequently notice my hand shakes when I try to do something.
159. I feel nervous if I have to meet a lot of people.
160. I would like to hear a great singer in an opera.
161. I am sometimes cross and grouchy without any good reason.
162. Every citizen should take the time to find out about national affairs, even if it means giving up some personal pleasures.
163. I like parties and socials.
164. My parents have often disapproved of my friends.
165. I do not mind taking orders and being told what to do.
166. In school I always looked far ahead in planning what courses to take.
167. I should like to belong to several clubs or lodges.
168. My home life was always happy.
169. Teachers often expect too much work from the students.
170. I often act on the spur of the moment without stopping to think.
171. I think I could do better than most of the present politicians if I were in office.
172. I do not have a great fear of snakes.
173. My way of doing things is apt to be misunderstood by others.
174. I never make judgments about people until I am sure of the facts.
175. I have had blank spells in which my activities were interrupted and I did not know what was going on around me.



176. I commonly wonder what hidden reason another person may have for doing something nice for me.
177. I am certainly lacking in self-confidence.
178. Most people are secretly pleased when someone else gets into trouble.
179. When I work on a committee I like to take charge of things.
180. My parents have generally let me make my own decisions.
181. I always tried to make the best school grades that I could.
182. I would rather go without something than ask for a favor.
183. Sometimes I feel as if I must injure either myself or someone else.
184. I have had more than my share of things to worry about.
185. I often do whatever makes me feel cheerful here and now, even at the cost of some distant goal.
186. I usually don't like to talk much unless I am with people I know very well.
187. I am inclined to take things hard.
188. I am quite often not in on the gossip and talk of the group I belong to.
189. In school my marks in deportment were quite regularly bad.
190. Only a fool would ever vote to increase his own taxes.
191. I can remember "playing sick" to get out of something.
192. When I meet a stranger I often think that he is better than I am.
193. I would be ashamed not to use my privilege of voting.
194. I like to keep people guessing what I'm going to do next.
195. The most important things to me are my duties to my job and to my fellowman.
196. I think I would like to fight in a boxing match sometime.
197. Once in a while I laugh at a dirty joke.
198. Before I do something I try to consider how my friends will react to it.
199. I would like to be a soldier.
200. In a group of people I would not be embarrassed to be called upon to start a discussion or give an opinion about something I know well.
201. I have no patience with people who believe there is only one true religion.
202. If given the chance I would make a good leader of people.
203. When things go wrong I sometimes blame the other fellow.
204. I like to plan a home study schedule and then follow it.
205. I enjoy a race or game better when I bet on it.
206. I have often found people jealous of my good ideas, just because they had not thought of them first.
207. Sometimes at elections I vote for men about whom I know very little.
208. I like to go to parties and other affairs where there is lots of loud fun.
209. Most people are honest chiefly through fear of being caught.
210. I very much like hunting.
211. I have frequently found myself, when alone, pondering such abstract problems as freewill, evil, etc.
212. I have never been in trouble with the law.
213. It makes me angry when I hear of someone who has been wrongly prevented from voting.
214. In school I was sometimes sent to the principal for cutting up.
215. I would like to write a technical book.
216. At times I have worn myself out by undertaking too much.
217. I think I would like the work of a librarian.
218. I love to go to dances.

219. Most people inwardly dislike putting themselves out to help other people.
220. I feel uneasy indoors.
221. People have a real duty to take care of their aged parents, even if it means making some pretty big sacrifices.
222. I would like to belong to a discussion and study club.
223. I keep out of trouble at all costs.
224. I usually expect to succeed in things I do.
225. People pretend to care more about one another than they really do.
- 226.** Most people worry too much about sex.
227. It is hard for me to find anything to talk about when I meet a new person.
228. I like to read about history.
229. I much prefer symmetry to asymmetry.
230. I would rather be a steady and dependable worker than a brilliant but unstable one.
231. I am apt to show off in some way if I get the chance.
232. Sometimes I feel that I am about to go to pieces.
233. A person does not need to worry about other people if only he looks after himself.
234. We ought to pay our elected officials better than we do.
235. I can honestly say that I do not really mind paying my taxes because I feel that's one of the things I can do for what I get from the community.
236. I am so touchy on some subjects that I can't talk about them.
237. The future is too uncertain for a person to make serious plans.
238. Sometimes I just can't seem to get going.
239. I like to talk before groups of people.
240. I would like to be a nurse.
- 241.** The man who provides temptation by leaving valuable property unprotected is about as much to blame for its theft as the one who steals it.
242. I am a good mixer.
243. I am often bothered by useless thoughts which keep running through my mind.
244. If I were a reporter I would like very much to report news of the theater.
245. Most of the time I feel happy.
246. I like to plan out my activities in advance.
247. When a man is with a woman he is usually thinking about things related to her sex.
248. I must admit that I have a bad temper, once I get angry.
249. I like mechanics magazines.
250. I must admit I find it very hard to work under strict rules and regulations.
251. I like large, noisy parties.
252. I sometimes feel that I am a burden to others.
253. When prices are high you can't blame a person for getting all he can while the getting is good.
254. I have never deliberately told a lie.
255. Only a fool would try to change our American way of life.
- 256.** I want to be an important person in the community.
257. I often feel as though I have done something wrong or wicked.
258. In school I found it very hard to talk before the class.
259. I usually feel that life is worthwhile.
260. I always try to do at least a little better than what is expected of me.
261. We ought to let Europe get out of its own mess; it made its bed, let it lie in it.
262. There have been a few times when I have been very mean to another person.
263. Lawbreakers are almost always caught and punished.
264. I would be very unhappy if I was not successful at something I had seriously started to do.

265. I dread the thought of an earthquake.
266. I think most people would lie to get ahead.
267. I am a better talker than a listener.
268. At times I have been very anxious to get away from my family.
269. I like science.
270. I often lose my temper.
271. My parents were always very strict and stern with me.
272. I must admit I feel sort of scared when I move to a strange place.
273. I am bothered by people outside, on street-cars, in stores, etc., watching me.
274. I'm pretty sure I know how we can settle the international problems we face today.
275. Sometimes I rather enjoy going against the rules and doing things I'm not supposed to.
276. I have very few quarrels with members of my family.
277. I have no fear of water.
278. If I get too much change in a store, I always give it back.
279. I often get disgusted with myself.
280. I enjoy many different kinds of play and recreation.
281. Society owes a lot more to the businessman and the manufacturer than it does to the artist and the professor.
282. A large number of people are guilty of bad sexual conduct.
283. I like to read about science.
284. It is hard for me to act natural when I am with new people.
285. I refuse to play some games because I am not good at them.
286. I have never done anything dangerous for the thrill of it.
287. I think I would like to belong to a singing club.
288. As a youngster I was suspended from school one or more times for cutting up.
289. There have been times when I have worried a lot about something that was not really important.
290. I have never been in trouble because of my sex behavior.
291. I think I would like to belong to a motorcycle club.
292. I used to like it very much when one of my papers was read to the class in school.
293. Every now and then I get into a bad mood, and no one can do anything to please me.
294. I feel that I have often been punished without cause.
295. I would be willing to give money myself in order to right a wrong, even though I was not mixed up in it in the first place.
296. I would like to be an actor on the stage or in the movies.
297. At times I have a strong urge to do something harmful or shocking.
298. I often get feelings like crawling, burning, tingling, or "going to sleep" in different parts of my body.
299. I don't seem to care what happens to me.
300. Police cars should be especially marked so that you can always see them coming.
301. I am afraid to be alone in the dark.
302. I have often gone against my parents' wishes.
303. We should cut down on our use of oil, if necessary, so that there will be plenty left for the people fifty or a hundred years from now.
304. When the community makes a decision, it is up to a person to help carry it out even if he had been against it.
305. I often wish people would be more definite about things.
306. I have nightmares every few nights.
307. If I am driving a car, I try to keep others from passing me.
308. I have a great deal of stomach trouble.

309. I have been afraid of things or people that I knew could not hurt me.
310. I would rather have people dislike me than look down on me.
311. I cannot do anything well.
312. Any man who is able and willing to work hard has a good chance of succeeding.
313. I hardly ever feel pain in the back of the neck.
314. I must admit I try to see what others think before I take a stand.
315. People should not have to pay taxes for the schools if they do not have children.
- 316.** My parents wanted me to "make good" in the world.
317. I often think about how I look and what impression I am making upon others.
318. When I was a child I didn't care to be a member of a crowd or gang.
319. In a group, I usually take the responsibility for getting people introduced.
320. I would be willing to describe myself as a pretty "strong" personality.
321. I almost never go to sleep.
322. I do not like to loan my things to people who are careless in the way they take care of them.
323. I have never done any heavy drinking.
324. Voting is nothing but a nuisance.
325. When I am feeling very happy and active, someone who is blue or low will spoil it all.
326. It is annoying to listen to a lecturer who cannot seem to make up his mind as to what he really believes.
327. I find it easy to "drop" or "break with" a friend.
328. I find that a well-ordered mode of life with regular hours is congenial to my temperament.
329. It is hard for me to sympathize with someone who is always doubting and unsure about things.
330. Everything tastes the same.
- 331.** I often start things I never finish.
332. I could be perfectly happy without a single friend.
333. Education is more important than most people think.
334. I get nervous when I have to ask someone for a job.
335. There are times when I act like a coward.
336. Sometimes I used to feel that I would like to leave home.
337. Much of the time my head seems to hurt all over.
338. I never worry about my looks.
339. I have been in trouble one or more times because of my sex behavior.
340. Our thinking would be a lot better off if we would just forget about words like "probably," "approximately," and "perhaps."
341. My people treat me more like a child than a grown-up.
342. Some people exaggerate their troubles in order to get sympathy.
343. In school most teachers treated me fairly and honestly.
344. I am made nervous by certain animals.
345. I go out of my way to meet trouble rather than try to escape it.
- 346.** I must admit I am a pretty fair talker.
347. I never make judgments about people until I am sure of the facts.
348. I usually try to do what is expected of me, and to avoid criticism.
349. If a person is clever enough to cheat someone out of a large sum of money, he ought to be allowed to keep it.
350. A person should not be expected to do anything for his community unless he is paid for it.
351. Some of my family have habits that bother and annoy me very much.

352. I must admit I have no great desire to learn new things.
353. No one seems to understand me.
354. A strong person will be able to make up his mind even on the most difficult questions.
355. I have strong political opinions.
356. I seldom worry about my health.
357. For most questions there is just one right answer, once a person is able to get all the facts.
358. I dream frequently about things that are best kept to myself.
359. I think I am usually a leader in my group.
360. It is impossible for an honest man to get ahead in the world.
361. I like to have a place for everything and everything in its place.
362. I have never seen a vision.
363. I don't like to work on a problem unless there is the possibility of coming out with a clear-cut and unambiguous answer.
364. It bothers me when something unexpected interrupts my daily routine.
365. The future seems hopeless to me.
366. I never seem to get hungry.
367. My home life was always very pleasant.
368. I have had no difficulty starting or holding my urine.
369. I seem to do things that I regret more often than other people do.
370. Disobedience to any government is never justified.
371. I would rather be a steady and dependable worker than a brilliant but unstable one.
372. I have reason for feeling jealous of one or more members of my family.
373. My table manners are not quite as good at home as when I am out in company.
374. I would never go out of my way to help another person if it meant giving up some personal pleasure.
375. There are certain people whom I dislike so much that I am inwardly pleased when they are catching it for something they have done.
376. I enjoy planning things, and deciding what each person should do.
377. Most of the arguments or quarrels I get into are over matters of principle.
378. I doubt if anyone is really happy.
379. I would rather not have very much responsibility for other people.
380. I am known as a hard and steady worker.
381. My mouth feels dry almost all the time.
382. Success is a matter of will power.
383. I usually have to stop and think before I act even in trifling matters.
384. Most people would be better off if they never went to school at all.
385. It is pretty easy for people to win arguments with me.
386. I know who is responsible for most of my troubles.
387. I don't like things to be uncertain and unpredictable.
388. When I am cornered I tell that portion of the truth which is not likely to hurt me.
389. I get pretty discouraged with the law when a smart lawyer gets a criminal free.
390. I have not lived the right kind of life.
391. I am quite a fast reader.
392. I daydream very little.
393. I have used alcohol excessively.
394. Even when I have gotten into trouble I was usually trying to do the right thing.
395. It is very important to me to have enough friends and social life.
396. I sometimes wanted to run away from home.
397. Once I have my mind made up I seldom change it.
398. Life usually hands me a pretty raw deal.

399. At times I have been so entertained by the cleverness of a crook that I have hoped he would get by with it.
400. I think I am stricter about right and wrong than most people.
401. Most young people get too much education.
402. I have had attacks in which I could not control my movements or speech, but in which I knew what was going on around me.
403. I have a natural talent for influencing people.
404. I am in favor of a very strict enforcement of all laws, no matter what the consequences.
405. People often talk about me behind my back.
406. I have one or more bad habits which are so strong that it is no use fighting against them.
407. I have had no difficulty in starting or holding my bowel movement.
408. I always see to it that my work is carefully planned and organized.
409. I would never play cards (poker) with a stranger.
410. I regard the right to speak my mind as very important.
411. I am bothered by acid stomach several times a week.
412. I like to give orders and get things moving.
413. I get all the sympathy I should.
414. I do not read every editorial in the newspaper every day.
415. I have felt embarrassed over the type of work that one or more members of my family have done.
416. I don't think I'm quite as happy as others seem to be.
417. Any job is all right with me, so long as it pays well.
418. I am embarrassed with people I do not know well.
419. It often seems that my life has no meaning.
420. I used to steal sometimes when I was a youngster.
421. I don't really care whether people like me or dislike me.
422. I feel like giving up quickly when things go wrong.
423. If people had not had it in for me I would have been much more successful.
424. The one to whom I was most attached and whom I most admired as a child was a woman (mother, sister, aunt, or other woman).
425. I have often felt guilty because I have pretended to feel more sorry about something than I really was.
426. There have been times when I have been very angry.
427. There are a few people who just cannot be trusted.
428. My home as a child was less peaceful and quiet than those of most other people.
429. Even the idea of giving a talk in public makes me afraid.
430. The things some of my family have done have frightened me.
431. As a youngster in school I used to give the teachers lots of trouble.
432. I am not afraid of picking up a disease or germs from doorknobs.
433. It is more important that a father be kind than that he be successful.
434. My skin seems to be unusually sensitive to touch.
435. If the pay was right I would like to travel with a circus or carnival.
436. I never cared much for school.
437. I am troubled by attacks of nausea and vomiting.
438. I would have been more successful if people had given me a fair chance.
439. The members of my family were always very close to each other.

440. There are times when I have been discouraged.
441. I have often been frightened in the middle of the night.
442. The trouble with many people is that they don't take things seriously enough.
443. I'm not the type to be a political leader.
444. My parents never really understood me.
445. I would fight if someone tried to take my rights away.
446. I must admit that people sometimes disappoint me.
447. If I saw some children hurting another child, I am sure I would try to make them stop.
448. People seem naturally to turn to me when decisions have to be made.
449. Almost every day something happens to frighten me.
450. I get sort of annoyed with writers who go out of their way to use strange and unusual words.
451. I set a high standard for myself and I feel others should do the same.
452. I dislike to have to talk in front of a group of people.
453. I work under a great deal of tension.
454. My family has objected to the kind of work I do, or plan to do.
455. There seems to be a lump in my throat much of the time.
456. I have more trouble concentrating than others seem to have.
457. A person is better off if he doesn't trust anyone.
458. People who seem unsure and uncertain about things make me feel uncomfortable.
459. My sleep is fitful and disturbed.
460. A strong person doesn't show his emotions and feelings.
461. It seems that people used to have more fun than they do now.
462. Even though I am sure I am in the right, I usually give in because it is foolish to cause trouble.
463. It is hard for me just to sit still and relax.
464. From time to time I like to get completely away from work and anything that reminds me of it.
465. I must admit that I am a high-strung person.
466. I am a very ticklish person.
467. At times I think I am no good at all.
468. I like to eat my meals quickly and not spend a lot of time at the table visiting and talking.
469. I must admit that it makes me angry when other people interfere with my daily activity.
470. If a person doesn't get a few lucky breaks in life it just means that he hasn't been keeping his eyes open.
471. I sometimes feel that I do not deserve as good a life as I have.
472. I feel that I would be a much better person if I could gain more understanding of myself.
473. I can't really enjoy a rest or vacation unless I have earned it by some hard work.
474. I sometimes tease animals.
475. I have a good appetite.
476. I had my own way as a child.
477. I get tired more easily than other people seem to.
478. I would be uncomfortable in anything other than fairly conventional dress.
479. I sweat very easily even on cool days.
480. I must admit it would bother me to put a worm on a fish hook.

APPENDIX B



## NELSON-DENNY READING TEST

TIME: 20 MINUTES

## COMPREHENSION TEST

PAGE 5

About three centuries after Homer's time, Greek poets began to discover new kinds of verse, and the way in which poems were made. No one has ever done so much for the poetry we write and read to-day as the singers who sang in the islands of the Aegean Sea and in cities on the mainland of Greece, like Thebes and Athens, during a few hundred years of supreme poetic activity.

Who were these poets? 5

Many names have come down to us, and very little poetry. Of some of the singers the Greeks thought greatest, only a few complete poems remain, and some fragments, usually quoted in the essays or romances or histories of other writers. For poetry had to be written down by hand or cut on stone, and war and fire, frost and earthquakes have destroyed most of the marble tablets and manuscript books that were made. Those remaining are like the fragments of a beautiful broken vase. Much is dust, much is marred or lost. The pieces will never be put together. We can only guess what the whole was like, we shall never know.

But from what the Greeks wrote of their poets in manuscripts that have survived, and from such poetry as we have, we can get some idea of certain great singers.

The first is Hesiod, a poet living not long after Homer, or perhaps in Homer's own time, among the Shepherds of Boeotia. It is possible that at the time Hesiod wrote, certain changes that were to take place in the Greek world had already begun. We know that it was not long after Homer's day that the cities and islands began to shake off the rule of kings. They made oligarchies, or governments-of-the-few, and democracies, or governments-by-the-people. They began to pay less attention to war and more to commerce, art, games, oratory, singing, dancing, and talking.

At any rate, Hesiod wrote much poetry suited to this quieter, friendlier life. He made a kind of encyclopedia of the gods, their ancestry, birth, adventures, and habits; and for hundreds of years, the Greeks consulted and quoted his *Theogony*. He wrote also *Works and Days*, a long poem about the times to plough and sow and the way to choose a wife and educate children and go about farming and trading. Such poems drew later poets more easily into poetry about their new life. They did not forget their heroes — Odysseus and Agamemnon and Theseus and Jason, but began to sing also of politics, trade, athletic contests, love.

As they turned to new subjects, they made a tremendously important change in poetry. One of their poets, Archilochus, began to make poems in a metre different from Homer's. He used word groups of two instead of three syllables — iambs they were called. He also used fewer feet in each line, often writing in trimeter and tetrameter (three-measure and four-measure) instead of hexameter. He began also to write poems ridiculing the faults of men and women — the beginning of what we call satiric poetry. He and other poets discovered that, not only was it possible to make one or two kinds of poetry different from the Epic verse, but that every thought or feeling could be sung in a poetry suited in metre to its own character. Epic poetry had been poetry of the race. The new poetry was personal.

One of the earliest of the new poets was Sappho. The Greeks used to say that Homer was the greatest of men who made poetry, and Sappho the greatest of women.

She lived in the island of Lesbos in the Seventh and Sixth centuries before Christ, and had there a school in which she trained young women to dance and make music and write and chant poetry.

1. *The Greeks considered Sappho as:*

1. The greatest woman poet.
2. Dancer rather than poet.
3. More musician than poet.
4. Greater than Homer.
5. The master of Epic poetry.

2. *One may characterize the development of Greek poetry as:*

1. Static.
2. Retrogressive.
3. Superficial.
4. Esoteric.
5. Progressive.

3. *Of the Greek poetry of that time:*

1. Much has survived.
2. Very little remains.
3. Most marble tablets remain.
4. Most parchment manuscripts survived.
5. Nothing remains except legend.

4. *Hesiod lived among whom?*

1. Shepherds.
2. Slaves.
3. Sailors.
4. Priests.
5. Philosophers.

5. *The new poetry was spoken of as:*

1. Ornate.
2. Patriotic.
3. Impersonal.
4. Personal.
5. Crude.

6. *The best inference is that poets:*

1. Reflect the times.
2. Mold the times.
3. Disregard the times.
4. Are not appreciated in their own age.
5. Are appreciated most after they are dead.

7. *What important poetic change did Archilochus effect?*

1. Rhyme scheme.
2. Stanza length.
3. Word form.
4. Sonnet form.
5. Metrical form.

8. *The most important change mentioned in poetry was change in what?*

1. Rhyme.
2. Rhythm.
3. Vividness.
4. Religious overtones.
5. Hero worship.

Do not stop here. Turn to page 6.

**COMPREHENSION TEST (Cont.)**

PAGE **6**

II

In each class are born a certain number of natures with a curiosity about their best selves, with a bent for seeing things as they are, for disentangling themselves from machinery, for simply concerning themselves with reason and the will of God, and doing their best to make these prevail;—for the pursuit, in a word, of perfection. To certain manifestations of this love for perfection mankind have accustomed themselves to give the name of genius; implying by this name, something original and heaven-bestowed in the passion. But the passion is to be found far beyond those manifestations of it to which the world usually gives the name of genius, and in which there is, for the most part, a talent of some kind or other, a special and striking faculty of execution, informed by the heaven bestowed ardour, or genius. It is to be found in many manifestations besides these, and may best be called the love and pursuit of perfection; culture being the true nurse of the pursuing love, and sweetness and light the true character of the pursued perfection. Natures with this bent emerge in all classes—among the Barbarians, among the Philistines, among the Populace.

III

The government of Henry the Seventh, of his son, and of his grandchildren was, on the whole, more arbitrary than that of the Plantagenets. Personal character may in some degree explain the difference; for courage and force of will were common to all the men and women of the House of Tudor. They exercised their power during a period of one hundred and twenty years, always with vigour, often with violence, sometimes with cruelty. They occasionally invaded the rights of the subject, occasionally exacted taxes under the name of loans and gifts, and occasionally dispensed with penal statutes; Nay, though they never presumed to enact any permanent law by their own authority, they occasionally took upon themselves, when Parliament was not sitting, to meet temporary exigencies by temporary edicts. It was, however, impossible for the Tudors to carry oppression beyond a certain point, for they had no armed force, and they were surrounded by armed people. Their palace was guarded by a few domestics, whom the array of a single shire, or of a single ward of London, could with ease have overpowered. These haughty princes were therefore under a restraint stronger than any which mere law can impose.

II

1. *One finds people with curiosity about their best self:*
  1. Only among the aristocrats.
  2. Only among poor people.
  3. Only among the poets.
  4. In all classes.
  5. Only among the Barbarians.
2. *To certain aspects of the desire to be perfect, men have often given the name:*
  1. Ability.
  2. Courage.
  3. Initiative.
  4. Genius.
  5. Common sense.
3. *Such persons are concerned with the pursuit of:*
  1. Money.
  2. Prestige.
  3. Power.
  4. Genius.
  5. Perfection.
4. *What is the chief topic discussed in this paragraph?*
  1. Genius.
  2. Culture.
  3. Pursuit of perfection.
  4. Passion.
  5. The will of God.

III

1. *With whom is the paragraph chiefly concerned?*
  1. The Tudor Kings.
  2. The Plantagenet Kings.
  3. The palace guards.
  4. The London populace.
  5. The English people.
2. *How were new laws secured when Parliament was not sitting?*
  1. They were made by a single London ward.
  2. Old laws were revived.
  3. They were made by the army.
  4. The King issued an edict.
  5. They were made by the Princes' council.
3. *Under what guise were taxes sometimes collected?*
  1. Fines.
  2. Loans.
  3. Tariffs.
  4. Commissions.
  5. Sale of public offices.
4. *What personal trait was always displayed by the rule of the dynasty discussed in the paragraph?*
  1. Cowardice.
  2. Deceit.
  3. Vigour.
  4. Vacillation.
  5. Forbearance.

Do not stop here. Turn to page 7.

**COMPREHENSION TEST (Cont.)**

PAGE 7  
→

**IV**

Great statesmen who looked far behind them and far before them were at the head of the House of Commons. They played their part with keenness, coolness, dexterity and perseverance. They were resolved to place the King in such a situation that either he must conduct the administration in conformity with the wishes of Parliament, or make outrageous attacks on the most sacred principles of the constitution. They accordingly doled out supplies to him very sparingly. He found that he must govern either in harmony with the House of Commons, or in defiance of all law. His choice was soon made. He dissolved his first Parliament, and levied taxes by his own authority. He convoked a second Parliament, and found it more intractable than the first. He again resorted to the expedient of dissolution, raised fresh taxes without any show of legal right, and threw the chiefs of the opposition into prison. At the same time a new grievance, which the peculiar feelings and habits of the English people made insupportably painful, excited general discontent and alarm. Companies of soldiers were billeted on the people; and martial law was, in some places, substituted for the ancient jurisprudence of the realm.

**V**

One man at the Explorers Club dinner, an old pro, looked with disfavor at the cooked walrus and seal meat. He was 87-year-old Matthew Henson, Admiral Robert E. Peary's Negro companion in his dash to the North Pole on April 6, 1909. Henson accompanied Peary on eight hazardous polar expeditions, had been forced to eat raw walrus and seal and even raw dog meat. He took one look at the walrus meat on a silver platter and turned away.

"Walrus is all right," said Henson, "when that's all there is."

Later that evening something occurred that emphasized Peary's and his accomplishment. Henson was presented with a piece of ice from the environs of the North Pole, a piece of ice gathered on a routine Air Force mission and flown to New York the day before.

Henson must have been impressed. Following dinner, he told how, in 1909, the North Pole was discovered in April, and it took until September to reach the outskirts of civilization and tell the world of the discovery. Today, aircraft cruise over the pole on leisurely flights. And in the planes, perhaps, there is little thought of Peary, Henson, and the four Eskimos who earlier braved that wilderness of ice.

**IV**

1. *What is the chief topic treated in this paragraph?*
  1. Attempt to establish a constitution.
  2. The levying of taxes.
  3. The right to billet soldiers.
  4. The break between King and Parliament.
  5. The use of martial law.
2. *Why did Parliament grant supplies sparingly to the King?*
  1. Taxes were too high.
  2. Because the King billeted soldiers on the people.
  3. To maintain the power of Parliament.
  4. Because certain chiefs were in prison.
  5. To insure re-election.
3. *What trait of the King's character is revealed?*
  1. Military ability.
  2. Power of decision.
  3. Tendency to compromise.
  4. Cowardice.
  5. Legislative ability.
4. *What grievance was insupportably painful to the English nation?*
  1. Billeting soldiers on the people.
  2. Forced service in the army.
  3. Imprisoning their chiefs.
  4. Convoking Parliament.
  5. Collecting taxes illegally.

**V**

1. *How was the piece of ice obtained?*
  1. On a routine air flight.
  2. Through use of a helicopter.
  3. From the Eskimos.
  4. By motor-driven ice sled.
  5. By a special air mission.
2. *While in the arctic, Henson's motto was apparently:*
  1. Necessity knows no law.
  2. Live and let live.
  3. Turn necessity to gain.
  4. Eat to live.
  5. Live to eat.
3. *How many made up the exploring party?*
  1. Four.
  2. Six.
  3. Eight.
  4. Fourteen.
  5. An unstated number.
4. *What is this passage mainly about?*
  1. The Explorers Club dinner.
  2. Peary.
  3. The discovery of the North Pole.
  4. Food likes and dislikes.
  5. Henson.

*Do not stop here. Turn to page 8.*

## COMPREHENSION TEST (Cont.)

PAGE 8

## VI

On one hand, the masses of the people in this country are preparing to take a much more active part than formerly in controlling its destinies; on the other hand, the aristocracy, using this word in the widest sense, to include not only the nobility, but also those reinforcements from the classes bordering upon itself, which this class constantly attracts and assimilates, while it is threatened with losing its hold on the rudder of government, its power to give to public affairs its own bias and direction, is losing also that influence on the spirit and character of the people which it long exercised. This will be warmly denied by some persons. Those who have grown up amidst a certain state of things, those whose habits, and interests, and affections, are closely concerned with its continuance, are slow to believe that it is not a part of the order of nature, or that it can ever come to an end. But what is here laid down, will not appear doubtful either to the most competent and friendly foreign observers of this country, or to those Englishmen who have applied themselves to see the tendencies of their nation as they are.

## VII

Man grew in the temperate zone, was born in the Tropics. That first crude human product of Nature's Pliocene workshop turned out in the steaming lowland of Java, and now known to us as the Pithecanthropus erectus, found about him the climatic conditions generally conceded to have been necessary for man in his helpless, futile infancy. Where man has remained in the Tropics, with few exceptions he has suffered arrested development. His nursery has kept him a child. Though his initial progress depended upon the gifts which Nature put into his hands, his later evolution depended far more upon the powers which she developed within him. These have no limit, so far as our experience shows; but their growth is painful, reluctant. Therefore they develop only where Nature subjects man to compulsion, forces him to earn his daily bread, and thereby something more than bread. This compulsion is found in less luxurious but more salutary geographic conditions than the Tropics afford, in an environment that exacts a tribute of labor and invention in return for the boon of life, but offers a reward certain and generous enough to insure the accumulation of wealth which marks the beginning of civilization.

## VI

1. *What does the author think about the power of the aristocracy? It is*
  1. More actively in control.
  2. Gaining power.
  3. Entirely lost.
  4. Gradually diminishing.
  5. Entrenched.
2. *Who are the slowest to realize the change which is taking place?*
  1. The masses.
  2. Foreign observers.
  3. The aristocrats.
  4. Government officials.
  5. Students.
3. *What other class does the author link with the nobility?*
  1. The masses.
  2. Competent foreigners.
  3. The educated.
  4. The studious.
  5. The upper middle class.
4. *The author compares his own views with those held by:*
  1. The masses.
  2. Able and kind foreigners.
  3. The aristocracy.
  4. The middle class.
  5. The nobility.

## VII

1. *Under what conditions does man reach the highest degree of civilization?*
  1. Where his wants are supplied by Nature.
  2. Where he is compelled to work for food.
  3. Where all of man's time is necessarily devoted to food-getting.
  4. Where Nature is most prodigal.
  5. Where vegetation is luxurious.
2. *What does the author think about the possibilities of human development?*
  1. They are very limited.
  2. Development occurs most readily in the Tropics.
  3. It is futile to expect development.
  4. It is fully arrested.
  5. There are no limits.
3. *The climate believed most conducive to later human evolution is:*
  1. The Tropics.
  2. The far North.
  3. The Temperate Zone.
  4. Java.
  5. Pliocene.
4. *What does the author believe to be an indication of the initial stages of civilization?*
  1. The amassing of a surplus over one's immediate needs.
  2. Migration from the Tropics.
  3. The beginning of the Pliocene Era.
  4. Painful, reluctant growth.
  5. Salutary geographic conditions.

Do not stop here. Turn to page 9.

**COMPREHENSION TEST (Cont.)**

PAGE 9

**VIII**

The only banking system in which a guaranty-fund provision is actually incorporated at the present time is that of Canada. According to the terms of the banking law of 1890, the notes of the bank are made a first charge upon all the assets of the issuing bank; also each stockholder may be forced to contribute his shares and a like amount in cash. In addition to this, banks are required to keep on deposit with the Minister of Finance a sum equal to 5 per cent of the average amount of their notes outstanding during the fiscal year preceding. In case of the suspension of any bank, its notes outstanding draw interest at 6 per cent from the date of suspension until the date set for their redemption. If such a day is not fixed by the directors of the defunct bank within two months from suspension, the Minister of Finance is authorized to appoint a date upon and after which they will be redeemed from the redemption fund. Until the fund is made good from the assets of the failed bank, all the banks of the system are required to contribute in their due proportion at a rate not exceeding 1 per cent on their circulation each year.

**VIII**

1. *In case the officials of a failed bank do not set a date for redeeming its notes, how is such a date established?*
  1. The Minister of Finance appoints the date.
  2. The date is set by law as two months after suspension.
  3. The stockholders fix a date.
  4. The creditors fix a date after two months.
  5. There is no provision for specifying a date.
2. *What is the largest amount a stockholder of a failed bank can be forced to contribute?*
  1. Five per cent of his shares.
  2. An amount fixed by the directors.
  3. An amount fixed by the Minister of Finance.
  4. His shares plus their face value in cash.
  5. To the full extent of his assets.
3. *What results in case the assets of a failed Canadian bank are not sufficient to redeem its outstanding notes?*
  1. The notes are paid as presented as long as the assets last.
  2. All note-holders suffer a pro rata loss.
  3. The Canadian Government makes good the loss.
  4. Other Canadian banks make good the loss.
  5. The bank's directors make the loss good.
4. *Why are banks required to keep a sum on deposit with the Minister of Finance?*
  1. As insurance on their assets.
  2. To protect holders of their notes.
  3. To guarantee a 6 per cent rate of interest.
  4. To assist banks that may fail.
  5. To protect stockholders of the bank.

STOP

*End of test. If time permits, you may recheck this section of the test.  
Do not go back to the Vocabulary Test.*

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APPENDIX C

## ROTTER'S INCOMPLETE SENTENCE BLANK

Name \_\_\_\_\_ Age \_\_\_\_\_

Date \_\_\_\_\_ Marital Status \_\_\_\_\_

Complete these sentences to express your real feeling. Try to do every one. Be sure to make a complete sentence.

1. I like \_\_\_\_\_
2. The happiest time \_\_\_\_\_
3. I want to know \_\_\_\_\_
4. I regret \_\_\_\_\_
5. Boys \_\_\_\_\_
6. The best \_\_\_\_\_
7. What annoys me \_\_\_\_\_
8. I feel \_\_\_\_\_
9. My greatest fear \_\_\_\_\_
10. I can't \_\_\_\_\_
11. When I was a child \_\_\_\_\_
12. Other people \_\_\_\_\_
13. My mind \_\_\_\_\_
14. I need \_\_\_\_\_
15. I am best when \_\_\_\_\_

APPENDIX D



## PROFESSIONAL SUCCESS TEST

1. Trade
  - A. exclaim
  - B. expect
  - C. explain
  - D. exchange
2. Brumal
  - A. balmy
  - B. winterlike
  - C. damp
  - D. penetrating
3. Reiterate
  - A. speak pompously
  - B. speak slowly
  - C. say again
  - D. defend a position
4. Evanescent
  - A. unvarying
  - B. universal
  - C. impermanent
  - D. fastidious
5. Skeptical
  - A. questioning
  - B. necessary
  - C. ridiculous
  - D. important
6. Piceous
  - A. discarded
  - B. valuable
  - C. stony
  - D. inflammable
7. Bogus
  - A. frightful
  - B. nauseous
  - C. better
  - D. counterfeit
8. Corvine cry
  - A. Crow-like
  - B. blood-curdling
  - C. loud
  - D. startled
9. Algae
  - A. chemicals
  - B. algebra
  - C. pond scums
  - D. wars
10. Threaten
  - A. menace
  - B. revolt
  - C. thrill
  - D. kill
11. Inanimate
  - A. provocative
  - B. inarticulate
  - C. lively
  - D. lifeless
12. Meandering
  - A. wandering
  - B. mushrooming
  - C. inviting
  - D. watery
13. Parchid
  - A. frightened
  - B. devoid of feeling
  - C. characterized by moisture
  - D. dry
14. Natal
  - A. relating to birth
  - B. relating to death
  - C. revengeful
  - D. African
15. Gambol
  - A. water
  - B. jump about
  - C. speculate
  - D. play an instrument
16. Malcyon days
  - A. peaceful
  - B. historic
  - C. ancient
  - D. disquieting

17. Sable  
A. light  
B. formal  
C. threadbare  
D. black
18. Unctuous  
A. hard  
B. pliable  
C. oily  
D. gritty
19. Hiatus  
A. fever  
B. friendship  
C. insurrection  
D. interval
20. Lampooned  
A. satirized  
B. praised  
C. surrounded  
D. caught
21. Addition  
A. superfluity  
B. amalgam  
C. pot pourri  
D. codicil
22. Bookish  
A. boorish  
B. bibliomaniacal  
C. studious  
D. rebellious

APPENDIX E

INDIVIDUAL TEST SCORES AND THE NUMBER OF PROFESSIONAL  
SUCCESS TEST (PST) ITEMS RECALLED

Subject	Cal. Psych. Inv.	ACT	Nelson- Denny Read.Comp. Test	No. of Inc.Items Recalled	No. of Comp.Items Recalled	Total No. of <u>PST</u> Items Completed
1	43.0	22	48	0	0	22
2	38.0	26	58	2	6	22
3	58.6	13	28	0	0	22
4	48.8	21	38	1	2	22
5	52.2	22	40	0	3	22
6	67.4	18	12	1	0	22
7	49.8	17	40	0	1	22
8	45.8	23	46	0	2	22
9	45.2	16	36	2	2	22
10	34.0	23	52	0	3	22
11	49.2	26	62	0	3	22
12	43.8	16	30	1	3	22
13	51.4	19	44	2	2	22
14	59.2	21	32	1	1	22
15	45.4	31	62	0	1	22
16	53.4	20	40	0	1	22
17	44.4	22	46	0	1	22
18	43.4	14	60	2	0	22
19	45.4	21	42	0	0	22
20	47.9	16	28	0	3	22
21	53.0	26	50	4	1	22
22	60.8	22	58	0	1	22
23	61.2	23	50	0	1	22
24	56.6	24	44	0	1	22
25	47.0	26	58	0	4	22
26	47.2	20	38	0	0	22
27	47.8	26	42	0	1	22
28	46.0	18	40	0	4	22
29	47.8	19	50	1	1	22
30	56.6	23	38	1	3	22
31	44.4	21	38	1	0	22
32	61.8	26	60	1	1	22
33	53.2	27	44	1	2	22
34	50.8	24	54	0	0	22
35	62.0	20	60	0	2	22
36	28.4	27	54	0	0	22
37	71.0	23	50	2	2	22
38	53.6	26	26	0	0	22
39	51.0	19	26	0	0	22
40	36.8	24	62	0	1	22
41	39.2	18	28	1	2	22
42	60.8	18	38	0	1	22
43	26.0	25	50	0	1	22
44	42.2	14	46	2	1	22
45	47.2	24	56	1	2	22
46	52.6	15	36	0	0	22

Subject	Cal. Psych. Inv.	ACT	Nelson- Denny Read.Comp. Test	No. of Inc.Items Recalled	No. of Comp.Items Recalled	Total No. of <u>PST</u> Items Completed
47	64.4	26	56	0	0	22
48	46.2	23	50	1	1	22
49	49.4	29	66	0	1	22
50	57.2	19	46	0	0	22
51	41.8	22	50	0	1	22
52	44.2	21	42	0	0	22
53	50.2	15	28	0	0	22
54	51.0	18	32	0	1	22
55	33.0	29	56	1	2	22
56	44.0	17	36	0	1	22
57	34.8	21	36	0	0	22
58	52.0	22	38	0	1	22
59	48.8	22	48	3	2	22
60	58.8	20	42	0	3	22
61	52.0	22	44	2	3	22
62	35.0	24	54	1	1	22
63	34.0	20	54	3	3	22
64	37.2	24	44	3	2	22
65	58.4	16	48	1	3	22
66	55.2	20	34	0	4	22
67	33.2	19	42	4	1	22
68	60.2	25	56	0	2	22
69	59.0	26	56	0	3	22
70	69.2	22	48	1	2	22
71	47.2	28	60	2	2	22
72	56.0	19	46	0	0	22
73	49.2	21	46	1	2	22
74	30.6	22	48	1	2	22
75	56.6	21	36	1	1	22
76	46.0	16	34	2	3	22
77	52.4	25	50	3	5	22
78	50.0	31	64	4	9	22
79	60.4	17	38	0	0	22
80	35.8	16	36	0	1	22
81	66.4	15	13	2	1	22
82	51.6	25	60	0	4	22
83	67.0	25	60	0	9	22
84	45.2	14	48	3	2	22
85	60.2	25	48	2	2	22
86	37.0	22	54	1	1	22
87	57.2	17	44	1	1	22
88	41.4	19	38	0	5	22
89	55.8	25	60	2	5	22
90	36.0	11	50	0	0	22
91	58.8	22	52	4	2	22
92	50.4	15	32	1	2	22
93	52.8	16	34	0	3	22
94	45.8	7	40	1	3	22
95	49.0	8	30	0	0	22
96	51.6	25	62	5	7	22

Subject	Cal. Psych. Inv.	ACT	Nelson- Denny Read. Comp. Test	No. of Inc. Items Recalled	No. of Comp. Items Recalled	Total No. of <u>PST</u> Items Completed
97	53.2	16	34	0	2	22
98	38.6	16	26	2	4	22
99	65.8	24	44	2	6	22
100	52.6	24	58	0	1	22
101	64.0	28	54	4	0	22
102	48.2	16	34	0	2	22
103	50.4	24	54	0	6	22
104	46.8	13	32	1	2	22
105	53.2	24	52	7	7	22
106	46.8	19	28	3	4	22
107	46.4	26	58	3	6	22
108	41.8	18	42	1	2	12
109	40.2	26	66	2	2	9
110	48.8	17	30	2	0	11
111	57.4	27	58	5	4	16
112	60.8	30	68	2	1	11
113	42.2	19	36	0	0	12
114	45.8	16	50	0	3	14
115	42.6	21	40	2	3	11
116	53.0	19	44	0	0	12
117	46.0	14	20	1	2	12
118	57.8	16	54	2	1	7
119	33.8	27	54	1	3	16
120	38.4	9	61	1	2	13
121	37.8	19	42	0	0	14
122	62.4	21	58	0	2	12
123	44.4	17	36	2	2	11
124	49.0	13	32	0	2	11
125	54.0	26	42	3	8	17
126	56.0	23	42	3	2	12
127	56.4	21	24	1	4	12
128	56.0	22	40	1	1	14
129	46.4	18	44	1	1	11
130	45.8	15	50	4	4	12
131	54.2	19	60	0	0	16
132	39.6	22	50	0	0	15
133	57.4	28	64	1	0	17
134	47.0	27	54	0	2	13
135	55.6	16	32	4	4	14
136	56.0	23	48	1	2	10
137	52.2	20	34	1	2	12
138	47.2	24	52	0	0	13
139	42.6	23	44	2	0	7
140	58.2	20	54	2	4	16
141	44.2	15	34	1	1	12
142	47.2	7	22	2	3	11
143	42.2	23	38	1	3	10
144	56.6	21	54	0	2	16
145	55.4	25	58	0	5	16

Subject	Cal. Psych. Inv.	ACT	Nelson- Denny Read.Comp. Test	No. of Inc.Items Recalled	No. of Comp.Items Recalled	Total No. of PST Items Completed
146	53.4	21	52	1	3	11
147	31.6	26	58	2	4	11
148	55.0	20	34	0	1	13
149	50.2	20	38	1	0	10
150	49.0	23	38	2	0	9
151	44.4	16	36	1	2	15
152	51.4	15	32	3	4	14
153	40.4	15	38	1	2	15
154	46.2	21	44	2	2	19
155	56.2	23	50	0	2	15
156	40.4	21	44	2	4	11
157	37.6	25	46	3	1	12
158	47.5	27	57	1	3	12
159	41.2	24	46	0	3	13
160	38.4	16	42	0	1	10
161	55.0	24	40	1	3	15
162	49.2	23	50	0	2	11
163	50.0	21	34	0	0	12
164	44.2	15	38	1	0	15
165	55.6	14	20	0	1	10
166	41.2	26	52	0	1	12
167	59.8	26	52	0	3	17
168	62.4	17	30	0	0	11
169	44.6	23	48	0	1	13
170	52.2	17	36	0	2	9
171	47.2	17	32	0	4	18
172	46.6	13	30	2	1	12
173	58.2	19	52	0	1	10
174	52.4	23	54	0	2	14
175	53.6	14	30	0	1	9
176	41.6	16	36	0	2	12
177	48.2	16	38	0	1	9
178	38.2	20	28	0	2	13
179	41.4	19	32	0	0	10
180	39.8	17	32	0	2	12
181	47.0	23	42	0	2	16
182	61.4	27	60	0	1	15
183	34.0	23	46	0	2	10
184	35.4	24	34	1	0	13
185	36.8	12	32	1	0	15
186	36.2	15	20	0	0	12
187	40.2	29	62	0	1	16
188	59.0	17	32	0	3	12
189	43.8	17	34	0	2	11
190	47.2	25	52	0	2	13
191	41.0	13	36	0	0	9
192	46.2	27	68	0	3	17
193	41.6	19	38	0	0	14
194	39.4	29	58	0	0	14

Subject	Cal. Psych. Inv.	ACT	Nelson- Denny Read. Comp. Test	No. of Inc. Items Recalled	No. of Comp. Items Recalled	Total No. of <u>PST</u> Items Completed
195	48.0	15	34	1	3	15
196	54.0	20	42	0	3	12
197	48.0	16	34	0	2	15
198	53.8	22	48	0	0	10
199	37.2	23	30	0	1	11
200	61.8	16	46	2	1	11
201	43.8	21	62	0	0	13
202	61.8	5	26	0	2	11
203	49.4	24	36	0	0	19
204	59.6	20	42	0	1	10
205	39.2	18	30	0	1	11
206	35.2	17	38	0	1	13
207	49.2	18	38	0	1	18
208	48.4	26	66	0	1	18
209	44.4	27	36	0	2	12
210	54.8	20	40	0	0	13
211	63.0	22	68	0	1	16



VITA →

Gary E. Ruchti

Candidate for the Degree of

Doctor of Education

**Thesis:** ACHIEVEMENT MOTIVATION AND ITEM RECALL ON OBJECTIVE EXAMINATIONS

**Major Field:** Educational Psychology

**Biographical:**

**Personal Data:** Born in Lancaster, Wisconsin, May 9, 1937, the son of Wilburn H. and Gertrude M. Ruchti.

**Education:** Attended elementary and secondary school in Fennimore, Wisconsin, graduated from Fennimore High School, Fennimore, Wisconsin; attended first year of college at the University of Wisconsin, Madison, 1955-1956; attended Wisconsin State University, Platteville, 1956-1959; received the Bachelor of Science degree with a major in Education from Wisconsin State University, Platteville, June, 1959; received the Master of Science degree with a major in Counseling from Mankato State College, Mankato, Minnesota, August, 1964; completed requirements for the Doctor of Education degree in August, 1969.

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