THE EFFECT OF NEED FOR ACADEMIC ACHIEVEMENT
ON THE PERFORMANCE OF COLLEGE STUDENTS
IN LEARNING CERTAIN STUDY SKILLS

DISSERTATION

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TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CHAPTER</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. THE PROBLEM</td>
<td>1</td>
</tr>
<tr>
<td>II. REVIEW OF THE LITERATURE</td>
<td>10</td>
</tr>
<tr>
<td>III. METHODS AND PROCEDURES</td>
<td>27</td>
</tr>
<tr>
<td>IV. PRESENTATION OF RESULTS</td>
<td>55</td>
</tr>
<tr>
<td>V. CONCLUSIONS, SUGGESTIONS FOR</td>
<td>104</td>
</tr>
<tr>
<td>FURTHER RESEARCH, AND SUMMARY</td>
<td></td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>117</td>
</tr>
<tr>
<td>APPENDIX A</td>
<td>122</td>
</tr>
<tr>
<td>APPENDIX B</td>
<td>134</td>
</tr>
<tr>
<td>APPENDIX C</td>
<td>139</td>
</tr>
<tr>
<td>APPENDIX D</td>
<td>146</td>
</tr>
</tbody>
</table>

iii
CHAPTER I

THE PROBLEM

In approaching the problem undertaken in this investigation the author was guided by two ideas. One was based on the current thinking of some psychologists regarding the need for systematic methods of measuring the strength of human motives. The other was related to the increasing awareness of many university personnel of the determining role which non-intellectual factors play in academic achievement. It was within this framework that the study was proposed. The problem here was to explore the possibility of measuring the need for academic achievement and to assess the role of this motive on the performance of college students in learning certain study skills.

INTRODUCTION

The importance of human motivation is stressed by contemporary psychological theory, but as indicated by some psychologists (3, 16, 17, 28, 30, and 33), theoretical advances in this area have been slow to develop. This has been attributed to the fact that there are no long-established methods of measuring human motives. Psychologists have found a solution to the problem of measuring animal motivation, especially with reference to the hunger drive. Here, they have controlled the strength of motivation in terms of hours of food deprivation. Needless to say, such a measure is of little value in the study
of the more complex acquired human motives. Recently, however, substan-
tial progress has been made in adding to the store of techniques of
measurement in the area of human motivation.

The methods by which human motives have been measured seem to fall
into three types: (a) those which depend primarily upon observations
of what an individual does, that is, his actual behavior in a variety
of situations; (b) those which measure what an individual says about
himself, including mostly the paper-and-pencil questionnaires; and (c)
those employing various kinds of projective techniques. These are not
conceived as independent methods since most investigations of motiva-
tion have used varying combinations of them. The purpose of the dis-
cussion which follows is to review briefly some of the many investiga-
tions that give evidence of the progress in this area of measurement.

Examples of those methods which depend mostly upon observations of
what an individual does in various situations can be found in the child
study field. Here, the dynamic behavior of children has been studied
in nursery schools and in specially constructed playrooms (2, 42). The
Hartshorne and May studies of character (20), the stress research of
the OSS during World War II (40), and the more recent work of Kelly and
Fiske (22) in their attempts to predict the performance of graduate
students majoring in clinical psychology, are three additional rather
well-known examples of this method of measurement. There seems to be
agreement among psychologists that such situational observations, in
general, offer an excellent opportunity to study human motives. The
chief methodological difficulties center around the problems of observer
reliability and criterion validity. Of course, the problem of whether a
person's behavior on any particular day or in any particular situation would be the same at another time or in a different situation has been the concern of psychological theorists for some decades. Too, everyone seems to agree that single or small groups of behavior samples do not permit valid inferences about an individual's behavior. In addition to these criticisms there is the important practical limitation that these methods are costly both in time and personnel.

In an effort to be more objective and to avoid the difficulties of observational studies, the use of rating scales, grades, and various achievement indices have been explored. To illustrate the use of these methods the following studies are offered as examples. Prescott and Garretson (43) had students, teachers, and principals rate the behaviors of graduating high school seniors. Of the behaviors rated, "desire to excel" was a variable of importance to the present research. They determined the relationship between these ratings and grades the students received in their first semester of college work. Correlations of approximately .60 were reported. Among the many other investigations which have attempted to predict academic achievement, are those of McQuary (32), Krathwohl (24), Sappenfield (48), and Young and Estabrooks (57). McQuary factor analyzed many variables which seemed to be related to achievement and found grades (high school percentile rank) to have the highest factor loading. Krathwohl computed an "index of industriousness" by determining the discrepancy between an individual's achievement test score and his aptitude test score in English. Sappenfield devised an "effort" index by dividing average grade of each student by his scholastic aptitude score. Young and Estabrooks
developed a "studiousness key" for use with the Strong Vocational Interest Blank for men. This key was based on items which tended to distinguish good from poor achievers in college. Scores computed with this key correlated fairly high with grades in Liberal Arts, but were only slightly related to grades in Commerce.

Despite the efforts of these attempts to overcome the objections of observational studies, the chief difficulty with them lies in finding or making use of suitable criteria against which to check the validity of the measurements made. In most of the investigations, the very contaminated criterion measure of grades had been used.

Examples of those methods which measure what an individual says about himself include primarily paper-and-pencil questionnaires. Of these, the test which has been used most extensively in motivation research, is the Taylor Anxiety Scale (54). A number of investigators in the Iowa Laboratory and elsewhere (12, 26, 27, 34, and 53) have been expressly concerned with the experimental and theoretical problems involved in testing the supposition that scores on this manifest anxiety scale reflect drive. As pointed out in her recent summary of the evidence concerning their work, Taylor notes that the interest of the Iowa group has not been in the study of anxiety itself, but rather in the role of drive in certain learning situations (53). This test appears to have limitations, however, in the study of academic achievement motivation. Much of the work performed with this test has been in an effort to investigate the effects of varying drive level on performance in learning simple tasks, as opposed to the more complex tasks involved in mastering college course-work. There is a question, too, of just what the test measures. Farber (17) would prefer the test be termed a test
of "excitability" or "level of responsiveness" rather than anxiety.

Another recently published test, which has been widely accepted in counseling settings as a valuable tool to obtain insights with respect to the need structure of clients, is the Edwards Personal Preference Schedule (15). This test was designed to provide a measure of a number of relatively independent personality variables (manifest needs). Two of these seem specifically related to a study of academic achievement motivation—n Achievement and n Endurance. In this schedule an attempt was made to minimize the influence of social desirability when responding to the test items. This was achieved by constructing pairs of statements which represent different personality traits and which were equal with respect to a social desirability value. The author hoped that this instrument would prove to be useful in psychological research; however, relatively few studies have been reported to date.

The most striking criticism of this group of measuring techniques is that it is relatively easy for a subject to recognize what the examiner is getting at because of the way test items are worded. It would seem that, depending upon how a subject is motivated, he could produce the kind of picture he so desires. It must be clear, too, that if a person taking this type of test has an inaccurate idea of what he is like, or how he acts in various situations, the results would hardly approximate a true measure of his level of motivation in the areas concerned.

When discussing the self-report techniques of measurement the disadvantage of transparency of meaning of the test items was pointed out. The implication of each item in these questionnaires is usually understood by the testee, thus the scores of these tests may be influenced by
the particular wishes of the subject. To some extent this is true of those approaches which depend upon observations of what an individual does. It is also the case with projective techniques but to a far lesser extent. The rationale of projective methods of measurement rests upon the assumptions of psychoanalytic thinking regarding the importance of unconscious processes and the recent laboratory findings concerning the relationship between motivation and the perceptual process. It is within the field of projective measurement that many advances have been made relative to the development of methods to measure human motives.

Among the projective tests employed in the study of human motivations are word-association tests, completion techniques, and the use of pictures. A few of the studies which have pointed out the significance of getting at unconscious motivation in assessing college achievement are those by Sanford (47), Kimball (23), Sargent (49) and Munroe (38). Of the investigations using projective tests, those employing the Thematic Apperception Test have achieved the most wide popularity. From the use of this technique, one of the most promising leads for the study of motivation has evolved. In 1947, a series of research projects was begun under the direction of D. C. McClelland. He and his associates began with the notion that if it would be possible to vary the strength of motivation in groups of subjects by controlling antecedent arousal conditions, it might then be possible to produce changes in their imaginative responses to pictures—response changes comparable to those produced in animal experiments by increasing hours of food deprivation. The chief aims of their studies were to show that the strength of human motives can be validly inferred from the content of imaginative thought,
and that differences in strength of motivation, as inferred from fantasy productions, is related to performance, perception and learning. These investigators have achieved considerable success with respect to the study of the need for achievement (30). A more comprehensive review of their work will be discussed in the next chapter.

The increasing volume of studies concerned with the development of the method just presented has suggested many problems, especially with respect to the study of specific human motives. Up to the present, the major part of the work of McClelland and his associates has been centered about the problem of devising a systematic method of measuring the need for achievement as defined by Murray (39). As this motive has been conceived as a person's desire to accomplish and get ahead in many and varied life situations, the question of the possibility of measuring more specific needs as they relate to specific situations is introduced. Too, in much of their research, the investigators have studied the effect of achievement motivation on immediate performance in simple learning tasks. It is within this framework that the present study is of significance. An exploratory study seemed warranted to examine the possibility of measuring a sub-type of the achievement motive—the need for academic achievement; and to determine the effect of such a motive on delayed performance in learning complex study skills—tasks more directly related to the motive in question.

**STATEMENT OF THE PROBLEM**

The purpose for undertaking this study was to explore the possibility of measuring the need for academic achievement, and to assess the
role of this motive on performance in learning certain study skills. The central question which guided the work in this project is: Will students who differ in academic achievement motivation, as inferred from fantasy productions to a picture interpretations test, show different performance in learning reading and note-taking skills?

With these objectives in mind, the present investigation was designed to incorporate the following variables and controls:

1. Need for academic achievement was aroused by instructional variation, devised to vary the degree to which good performance on the tasks would be interpreted by the subjects as evidence of their competence in an academic setting.

2. Strength of this motive was inferred from fantasy productions to a picture interpretations test on the basis of a content analysis. The factor of stimulus cue-value in the pictures was controlled by drawing them so as to suggest the possibility of study activity to a greater or lesser extent.

3. Training sessions were held throughout a period of ten weeks for the purpose of teaching students the study skills of reading and note-taking, and for obtaining measures of their performance in learning these skills.

4. A scrambled words task was utilized to obtain a measure of the effect of motive arousal on immediate performance in learning a simple verbal task. This test was administered immediately after the measure of motive strength.

5. Factors of initial skill level and verbal ability were controlled by matching procedures. These factors were equal for groups of different levels of motivation.

6. Factors of length of time exposed to an academic setting and sex were also controlled.

7. The experimental design was one which permitted the investigator to assess the effect of motive state on the performance of college students in learning the various tasks.

It is hoped that the results of this research may shed light on one of the many problems of human motivation; namely, that relating to the
nature of individual differences on the motivational side of college work.

**SUMMARY**

The question of the possibility of measuring a sub-type of the achievement motive, the need for academic achievement, has been raised. Several types of methods employed to measure the strength of human motivation have been reviewed briefly demonstrating what appears to be the fact that it may be possible to measure the need for academic achievement by the thematic apperception method. Further, a critique of the existing methods has been made and a statement of the characteristics of an adequate experimental design has been set forth.

**ORGANIZATION OF THE DISSERTATION**

A discussion of the historical background of the picture interpretations method and a review of pertinent research follows in the next chapter. Chapter III presents the methods and procedures employed in this study. The analyses of data and results are given in Chapter IV. Chapter V deals with a discussion of the conclusions, suggestions for further research, and a summary of the research.
CHAPTER II

REVIEW OF THE LITERATURE

There have been few studies reported in the literature which have a direct relationship to the problem of this study. With reference to certain specific aspects, however, some are pertinent to the present investigation. These studies will be presented in more detail than the works which have less bearing on the immediate problem.

A BRIEF HISTORY OF THE PICTURE INTERPRETATIONS METHOD

Historically, the picture interpretations technique as developed by D. C. McClelland and his associates, is related most closely to psychoanalytic thinking about motivation and to the methods of motive arousal employed in the experimental investigations of animal motivation. The hypothesis that free associative, unguarded thought provides a rich source of evidence concerning human motivation was basic to the thinking of the initial explorations of McClelland and his co-workers. This view, needless to say, was adopted from psychoanalytic theory. However, McClelland and those working with him believed it was unjustifiable to draw inferences about the strength of human motivation on the basis of imaginative material alone. It was here, then, that they accepted the notion from experimental studies of animals that motives could be experimentally aroused and their intensity controlled by manipulating the arousal conditions.

Early research studies. McClelland and his associates decided
first to test the hypothesis that thematic records would reflect the effects of differential motive conditions. The initial experiment in this series, one by Atkinson and McClelland (6), was designed to determine the effects of hunger drive on a sampling of imaginative behavior. The results of this study gave evidence that male trainees at a submarine base who were deprived of food for one, four, and sixteen hours wrote imaginative stories which were increasingly concerned with food deprivation, food-getting activities, hunger, and the like. On the basis of these findings it was hypothesized that the intensity of a person's hunger motivation could be estimated by summing algebraically those characteristics in his stories which had been demonstrated to increase or decrease significantly in frequency with increasing hours of food deprivation. It was found that this index of motivational level predicted fairly well how long the individual had been without food.

It is necessary to point out to the reader that these investigators recognized that such an index of hunger drive was only an approximate one. They were aware that this index could not be a simple function of hours of food deprivation. Nevertheless, they did believe that thematic records do reflect the presence and intensity of motivation.

Later research studies. Their initial hypothesis, regarding the possibility of measuring strength of motivation from fantasy material, seemed to be supported by their first effort. Because of this promising lead, the same experimental design was used in studies of the achievement motive, the affiliation motive, and the sex drive. McClelland, Clark, Roby, and Atkinson (31) aroused the achievement motive of college
students by having them take a series of intelligence-type tests under instructions designed to heighten their desire to do well. These tests were usually administered immediately before the imaginative stories were written. The low motivation or control condition employed was one involving a pre-test period where the subjects were deliberately discouraged.

Shipley and Veroff (52) and Atkinson, Heyns, and Veroff (3) studied the affiliation motive of fraternity brothers. The condition of motive arousal was achieved by engaging the subjects in a period of sociometric ratings of each other so as to heighten their interest in being accepted and liked. The control condition in one experiment (52) was one without the arousal procedure, and a neutral classroom situation in the other (3).

Clark (9) investigated the sex drive of male college students by having them make judgments related to a theory of body type. He used large pictures of nude females as stimuli for the arousal of their sex drive. These pictures were exposed to the students during a pre-test period. The controls looked at landscape scenes before writing stories. In all of these studies, the stories written under conditions designed to be more highly motivating contained more imaginative responses dealing with thoughts, feelings, and actions related to the overt action or problem-solving sequence one would normally expect from a motivated person. Thus, the generalization which seems to be supported is that as strength of motivation increases so does the frequency of thoughts and actions corresponding to the goal-directed sequence of the motive in question.
There were some exceptions to these findings. McClelland (30) pointed out that even if it is assumed that such a procedure is in general a justified way of measuring motivation, it is possible that under certain conditions individuals with fairly high motivation will fail to express it even in fantasy because of basic anxieties relating to the motivation under study. He did not feel that this was a serious problem because he felt there would probably always be a small percentage of every population tested for whom this measure of motivation would not be adequate.

STUDIES RELATED TO THIS RESEARCH

Up to this point an attempt has been made to present a brief summary of the investigations which show that McClelland and his associates had found it possible to produce response changes to pictures which were comparable to those produced in animal experiments by increasing hours of food deprivation. The following discussion summarizes the research which seems most pertinent to this study. The aims of these investigations were to show that achievement motivation can be validly inferred from the content of imaginative thought, and that differences in strength of achievement motivation, as inferred from fantasy productions, are related to performance and learning. In general, the question posed by these investigations was: If the n Achievement score, an index of the need for achievement, is a measure of achievement motivation, should it not be significantly related to work output in various types of tasks? The present research design was planned within the framework of these investigations; a review of them follows.
Clark and McClelland's study. This study (10) was concerned with the relationship between an index of need for achievement and number of words obtained in successive minutes of an Anagrams test. The Anagrams test required the subjects to make as many different words as they could out of the word generation. Subjects were required to make a check mark every minute, over a period of twelve minutes, so that output could be computed for successive one, two, and four-minute periods. Two motive arousal conditions were used. An Achievement-oriented instruction condition presented the tasks as measures of important abilities and subjects were urged to do their best. In a Task-oriented instruction condition it was simply pointed out how the tasks were to be performed and the question of what they might or might not measure was ignored completely. The purpose of procedures preceding the measure of motivation in the latter condition was neither to depress nor to increase the level of motivation, but rather to obtain a measure of the motivation subjects brought with them to the situation.

In the discussion of the results of their study, Clark and McClelland noted that in every breakdown for the Task-condition there was a significant relationship between an Achievement score and the middle section of the output curve for Anagrams. However, under Achievement-oriented conditions, none of the correlations was significant at the 5 per cent level of confidence. This finding was puzzling to them. However, since output on any particular minute in a test of this sort appeared to be a function of the number of possible words still left to be taken out of the key word, it was decided to repeat the experiment using a task similar in nature to anagrams but without this defect.
Lowell's study. To overcome the limitation mentioned with reference to the study by Clark and McClelland, Lowell designed an experiment to illustrate the relationship between performance and frequency of achievement-related imaginative responses in stories (25).

He constructed a Scrambled Words test which consisted of a series of four-, five-, and six-letter disarranged words selected from the first 500 most frequently used words in the Thorndike-Lorge Word List. These were arranged on different pages in different orders, and tests were randomly distributed among subjects in order to randomize any differences in difficulty at successive periods in the output curve. The test was administered after the subjects had, first, responded to a picture interpretations test under Task-oriented instructions. Subjects were allowed two minutes to work on each page of scrambled words. He returned to the classroom situation a week later, explained to the subjects that he had not been able to complete his work the week before, and administered an equivalent form of the picture interpretations measure of n Achievement and also an Additions test. The latter test was like the Scrambled Words task. On each page of the test there were several sets of two three-digit numbers to be added with a time limit of one minute per page.

Lowell obtained an estimate of each subject's strength of need for achievement by combining the scores obtained on the two administrations of the picture interpretations test. He divided the distribution of over-all n Achievement scores into high and low halves and obtained the mean word output for 10 two-minute periods for each half of the distribution.
He found that subjects who had high \( \text{n} \) Achievement scores were no more productive on the initial trials of the task than those who had low \( \text{n} \) Achievement scores. However, the highs showed significant improvement in unscrambling words on later trials of the testing period while the group assumed to be less motivated did not. He interpreted this as evidence that motive strength is related to learning when the task is initially difficult enough to demand some learning for subsequent improvement in performance. In the discussion of his results, he pointed out that while the details of what actually was learned in this experiment had not been carefully worked out, this finding was consistent with the contention of some theorists (17, 33) that learning implies the presence of motivation. For the arithmetic task, performance during consecutive time periods was plotted separately for the groups showing different levels of achievement motivation. On this task, where the skills involved were presumably over-learned to a high degree, the high \( \text{n} \) Achievement group was significantly more productive than the low \( \text{n} \) Achievement group at every point on the output curve.

McClelland thought the results of Lowell's study to be important for two reasons (30). In the first place, he believed that the results of this study provided an explanation for the correlation obtained between \( \text{n} \) Achievement score and the middle section of the Anagrams test in the investigation discussed previously. He stated that output is bound to decline on successive trials of Anagrams because it becomes progressively more difficult to get words out of the key word. As a consequence, the effect of learning was to lessen the drop in output. This is what Clark and McClelland found for the high \( \text{n} \) Achievement group.
in their study. It was reasoned that \( n \) Achievement is related only with the middle section of the Anagrams test, because only there could the superior learning of highly motivated subjects demonstrate itself. If this were true, one would expect that in Lowell's Scrambled Words task the correlation between \( n \) Achievement and output on successive trials would increase regularly from the first to last periods as the effects of learning grow more pronounced. Product-Moment correlations were determined between \( n \) Achievement scores and output on the Scrambled Words test. Although none of these reached the 5 per cent level of significance, they did show the predicted trend. Therefore, both Lowell and McClelland believed that the results of the two experiments in question were consistent. In both instances a correlation between \( n \) Achievement and performance appeared where the opportunity for learning permitted the higher \( n \) Achievement group to perform at a superior rate.

The second reason why McClelland believed these results to be significant is that some theorists, notably Miller (33), have argued that the decisive criterion for determining whether a motive is operating in performance is whether or not it can produce learning. In Lowell's study there was clear evidence of learning in the high \( n \) Achievement group. It was therefore concluded that the \( n \) Achievement score is a measure of an individual's need for achievement.

In summary, then, Lowell's experiment demonstrated that high \( n \) Achievement score is associated with learning when learning is required (or possible) and with speed of performance when learning is not.

While it was not the specific purpose of the present research to verify the results obtained by Lowell, a Scrambled Words task was
included in the design of this study in the hope of obtaining an alternative and more immediate measure of performance from which the effects of need for academic achievement in learning a verbal task might be observed. It was hoped that this analysis might shed some light on possible differences between immediate and longitudinal measures of performance in learning as they relate to need for academic achievement.

Parrish and Rethlingshafer's study. This investigation represented an attempt to study the relationship between McClelland's measure of $n_A$ Achievement and scholastic achievement ($A_l$). They reasoned that if the need to achieve is a critical factor in scholastic success, and if McClelland's method measures this need, then two groups of subjects, who are equated for scholastic aptitude, but who differ with respect to school success should show significant differences in $n_A$ Achievement score. They administered a four-picture test of achievement motivation to two groups of 24 subjects who had been equated with reference to scores on the American Council on Education Psychological Examination (ACE), a scholastic aptitude test, but who differed with regard to college success. One group had a grade average of B or better, and the other group had an average of C or lower. Both groups averaged approximately at the 94th percentile on the ACE according to college freshmen norms. They found no significant differences between $n_A$ Achievement scores of the two groups. Their conclusion was that $n_A$ Achievement, as it had been defined by McClelland, did not vary with scholastic achievement. They noted that their negative results might be explained by the possibility that subjects who demonstrated poor scholastic performance
in college may not have been ego-involved by their failure. They reasoned that if subjects were indifferent to their histories of school failure, their failures could not be expected to heighten their Achievement scores. They thought, too, that their results could be explained by the fact that the effect of failure may change as time passes. They pointed out that the subjects in their study had been experiencing failure for some months, whereas the subjects used in the work of McClelland, et al (30) wrote stories immediately after their failure experiences. What the precise effect of this longer time elapse between the experience of failure and the test of Achievement could be, they thought could not be known from their investigation. However, they believed that the urgency of the feeling aroused by failure could disappear, that is, the experience could be assimilated by the personality of the subject. All this suggested, they thought, that what McClelland has measured is the immediate effect of an ego-involved failure, and that such failure has only a superficial, or temporary, effect on the need to achieve.

Morgan's studies. Two other relevant studies were reported by H. H. Morgan. One was completed by him as part of his Ph.D. dissertation (36). He was interested in the various personality correlates of "achievers" and "non-achievers." All the subjects he used had scored at or beyond the 96th percentile on the ACE according to University of Minnesota norms. The point-hour ratio of the "achievers" was 2.1 or better, while that of the "non-achievers" was 1.2 or less. A six-picture measure of Achievement was administered to 40 "achievers" and
He found that the individuals with high academic grades obtained significantly higher \( n \) Achievement scores than those with low academic grades.

In another study, Morgan (35) administered a picture interpretations test to five groups of boys in an academic and vocational high school. Low to moderate relationships were found between \( n \) Achievement scores and school grades, but these relationships tended to be somewhat less when intelligence was held constant. He also found that the correlations between \( n \) Achievement scores and grades varied from one group of students to another. He thought these variations could be attributed to: (a) the limited size of his samples; (b) the unreliability of a grade criterion; (c) the unreliability of the picture interpretations test itself, since test-retest reliability coefficients on alternate forms were reported to be .56 and .64, respectively; and (d) the differential effectiveness of the various determinants of the \( n \) Achievement score. From the results of his study, he concluded that prediction on the basis of individual \( n \) Achievement scores could not be made with confidence at the present stage of test development.

Controversy over what \( n \) Achievement scores reflect. At this point in the presentation of studies related to the present research, it seems important to discuss briefly a controversy over what \( n \) Achievement scores reflect. Brown (7) and Farber (17) argue that what is being identified by \( n \) Achievement scores are not really motives at all. They contend that achievement scores merely reflect a general response tendency (or verbal habit) which seems to influence performance in a wide
variety of situations. According to their point of view, subjects with high achievement scores simply have the habit of being or at least appearing to be "eager." In other words, they believe it is probable that these individuals have learned certain work habits of an "effortful" or "active" sort. They refer to a study by Miller to emphasize the distinction between drive-produced activity and learned activity.¹ Miller found that it was possible to train rats to be extremely active when hungry if pellets of food were widely scattered about a maze. Miller noted that rats trained in this manner were more active than untrained animals, even though the latter were actually operating under conditions of greatest hunger. The conclusion drawn by Brown and Farber, is that human subjects tend to produce both more correct and incorrect responses while working under achievement-oriented instructions because they have developed strong habits to be "eager-appearing" as a result of previous learning.

To meet this criticism, McClelland (29) has the following to say:

I don't want to seem too lighthearted about psychological theory, but I should hate to see much energy expended in debating the point. If someone can plan and execute a better research by calling these measures habits, so much the better. If, furthermore, it should turn out that all the interesting findings we have turned up are the result of some theoretical "error" in our thinking, I cannot admit too much regret. The fact of the matter is that we know too little about either motives or habits to get into a very useful discussion as to which is which. The important thing is that we accumulate data as rapidly and systematically as we can. Then

¹Miller, Neal E. The role of motivation in learning. In Symposium on psychology of learning basic to military training problems. Panel on Training and Training Devices. Res. & Dev. Ed., 1953, 103-116. This article was not available to the present writer but was reviewed by Farber, I. E. The role of motivation in verbal learning and performance. Psychol. Bull., 1955, 52, 311-327.
imaginative responses to a picture interpretations test imply individual differences in motive strength, since certain kinds of imaginative responses occur more frequently when motivation is experimentally aroused.

A more detailed discussion of the general experimental procedures follows.

**SETTING OF THE EXPERIMENT**

The setting of the experiment was a how-to-study course taught in the Department of Psychology (Psychology 111) at The Ohio State University. The study was conducted over a period of ten weeks as part of the laboratory work of this course, Spring quarter, 1955.

The goal of the course, the Psychology of Effective Student Adjustment, is to help students develop the efficient work skills which are necessary in college so that they may be able to make effective use of their time and efforts in dealing with course assignments. The course is divided into fourteen projects which are described by F. P. Robinson in his text, Effective Study (14). In the course emphasis is placed on three general areas: (a) teaching and coaching students in the use of higher-level work skills, (b) the diagnosis and remediation of reading, writing, and mathematic deficiencies which affect their schoolwork, and (c) the diagnosis and handling of problem areas which distract students from effective study. Of the areas treated, those of most importance to this investigation are the ones designed to aid students in developing higher-level work skills and improving reading skills. The projects concerned with these methods of study as presented by Robinson are called:
I believe these theoretical issues will have a way of boiling themselves down to a meaningful level at which they can be settled.

A discussion presented by Atkinson (3), with respect to a conception of the determinants of imaginative responses, also seems to have a bearing on this controversy. He points out that the cues of a variety of learning situations—early parental demands for independence, the schoolroom, the athletic-field—acquire the property of arousing anticipations of rewards and punishments to the extent that these cues are associated with the affective consequences of evaluated performance. In light of this conception, the arousal of a motive is equivalent to the arousal of a family of perceptual and instrumental response dispositions whose strength may be accounted for in terms of the principles of associative learning. He notes that the Wesleyan group accounts for the strength of a particular family of response dispositions accompanying the arousal of a motive by referring to contiguity and frequency of association during the same series of learning experiences which are considered to account for how the motive was learned.

A motive, here, is conceived as an anticipation (or expectancy) of an affective change. The important factors in the acquisition of a motive are presumed to be the contiguity, frequency, amplitude, and rate of affective changes associated with a cue. Neutral cues acquire the property of arousing a motive by being associated with affective changes. As a result of this association, cues on later occasions are thought to arouse anticipations of pleasure or anticipations of pain (30). From this point of view, all motives are learned. To illustrate what is meant by this, they use hunger as an example. McClelland and
his associates would not deny that on the very first occasion of food deprivation some important changes take place within an organism which probably produce diffuse reactions of various sorts including presumably, a negative affective state. However, they would not speak of an organism as motivated until the cues resulting from the food deprivation had been followed a number of times by the sensory pleasure of eating and subsequent affective changes when food is digested. After such associations, the cues produced by food deprivation would arouse anticipatory representations of the events that had previously followed. They would now speak of the arousal of a food motive, and mean by this, an anticipatory goal state—an expectation of the affective change contingent upon eating.

Likewise, they would account for the acquisition of an achievement motive by noting the association of certain cues with rewards and punishments accompanying the evaluation of performance in numerous experiences throughout life.

The arousal of a motive, then, is believed to mediate the arousal of perceptual and instrumental response dispositions corresponding to various aspects of behavioral sequences which in the past history of the organism have been instrumental in producing the same goal state.

Atkinson (3) indicates that he believes the empirical findings from their many research efforts support this interpretation. He quotes results from an investigation by Rosenstein (146) as additional evidence. Rosenstein found that both Chemistry majors and Physical Education majors produced a great number of achievement-related responses to pictures of athletic-competition situations, a practically universal
achievement-training experience for males in our culture. However, the Chemistry students gave a significantly greater number of achievement-related responses than the Physical Education people to pictures of men working in laboratory situations. The assumption of a greater frequency of unique rewarding experiences in laboratory situations for the Chemistry subjects was thought to account for the greater frequency of achievement-related imaginative responses to these particular pictures.

Because the present study was designed within the framework of the work accomplished by the Wesleyan group, and since it seems probable that variations in habit strength of verbal responses might themselves be attributable to variations in drive, it was thought to be more meaningful for this research to accept the views of this group of experimenters. For these reasons, then, the present writer accepted the supposition that individual differences in frequency of achievement-related imaginative responses may indeed reflect the strength of an individual's need to achieve.

Differences between the present study and those reviewed. There are two important differences between the design of the present study and those which have just been reviewed. First, up to the present, the major part of the work of McClelland and his associates has been concerned with the development of a systematic method for measuring the need for achievement as defined by Murray (39). This motive has been conceived as a person's desire to work at something with energy and persistence—to strive to accomplish something creditable in many and varied life situations. Consequently, as noted in Chapter I, the
question of the possibility of measuring more specific needs as they may relate to performance in specific life situations is introduced. The present investigation was designed, therefore, in an attempt to explore the possibility of measuring a particular kind of achievement motive—the need to achieve in an academic setting.

The second major difference between this study and those concerned with the achievement motive is that in the present investigation the criterion measures are longitudinal ones and seem to be more directly related to achievement in an academic setting than those measures of performance employed in the previous studies. The criterion measures employed in the studies by McClelland and his associates (30) were, in general, immediate in nature and not directly related to performance in an academic setting on an academically related task. As stated in Chapter I, in the present study an attempt is made to assess the differences on performance of college students in learning reading and note-taking skills, that is, between students who demonstrate various levels of need for academic achievement. Samples of note-taking skill were taken periodically at two-week intervals throughout a quarter term of ten weeks; and scores were obtained for each subject at the beginning and at the end of the quarter on both reading rate and comprehension accuracy.

It is with respect to these differences in design that the present investigation is thought to be of significance.

A summary note. In this review of the literature an attempt has been made to structure a frame of reference for the present study.
Those studies which seemed most pertinent to this research have been presented in detail. The studies of primary concern were those relating to the research begun under the direction of D. C. McClelland in 1947, which give promise of measuring individual differences in achievement motivation by the thematic apperception method. Of these investigations, those of most importance were the experiments designed to explore the relationship between McClelland's index of the need for achievement and learning or efficiency in the performance of various types of tasks. The differences between the designs of these projects and the present study have been noted. The question of the possibility of measuring a particular kind of achievement motivation—the need for academic achievement has been raised in Chapter I. Also, the question of the role of this motive in the acquisition of reading and note-taking skills has been posed.

In the next chapter a discussion of the methods and procedures used in this study is presented.
METHODS AND PROCEDURES

The present research was guided by the following question: Will subjects who differ in academic achievement motivation, as inferred from fantasy productions to a picture interpretations test, show significantly different performance in learning reading and note-taking skills?

DESIGN OF THE EXPERIMENT

The experiment was designed to determine the relationship between two response variables. The author's primary concern in this study was to determine whether or not a particular measure of the need for academic achievement is related to performance in learning certain study skills. Therefore, this study was designed to assess the differences on performance in learning reading and note-taking skills between groups of college students classified according to different levels of need for academic achievement.

The setting of the experiment was a how-to-study course taught in the Department of Psychology at The Ohio State University. The study was conducted over a period of ten weeks as part of the laboratory work of this course, Spring quarter, 1955. The subjects employed were third-quarter freshmen students who were enrolled in Psychology 411 at the time.

The experiment was performed under two conditions of motive arousal designed to vary the degree to which good performance on the tasks would be interpreted by subjects as evidence of their competence in scholastic
and social affairs in a college setting. First, the students worked under a Task-oriented set of instructions, and second, they were tested under an Academic Achievement-oriented instructional condition. The strength of the subjects' need for academic achievement was inferred from their fantasy productions to a picture interpretations test on the basis of a content analysis. The test was composed of pictures drawn to suggest the possibility of study activity to a greater or lesser extent. Subjects were classified into three groups representing different motivational levels, high, medium, and low, on the basis of their Academic Achievement scores derived from the analysis of their stories to the picture interpretations test. To assess the differences between these groups on performance in learning a verbal task at the time of motive-arousal, a Scrambled Words Test was administered to them immediately after they had responded to the picture interpretations test. To assess the differences between these groups on performance in learning reading skills, measures were obtained from each student at the beginning and at the end of the quarter on both reading rate and comprehension accuracy. To assess the differences between these groups on performance in learning note-taking skills, measures were obtained from them on: (a) working rate while reading and taking notes, and (b) quality of notes. These measures were obtained over a series of five training sessions which were held at two-week intervals throughout the quarter as part of the laboratory assignments in Psychology 111.

The assumption underlying this type of design is the same as that which was basic to similar research by McClelland, et al (30). The assumption is that individual differences in the frequency of certain
(a) the Survey Q3R Method of Studying, (b) Skills in Attack and Concentration, and (c) Reading Ability (IU). The Survey Q3R Method of Studying has five steps which form an integrated method of study. They are: (a) glancing over the headings in the material to see the few big points which the author plans to develop (Survey), (b) starting to read by turning the first heading into a question (Question), then (c) reading to answer that question (Read), finally (d) having read the first section, looking away from the material to briefly recite the answer to the question (Recite), and lastly (e) when the article has been read through, looking over the notes to get an over-all view of the points and their relationship so as to check memory of the content by reciting the major subpoints under each heading (Review).

The projects mentioned are taken up early in the quarter and each step is explained and discussed thoroughly. The students are given practice and personal counseling throughout the quarter. These activities are designed to give the students as much opportunity as possible to learn how to work by using these techniques. Students are also urged to use the methods in doing their other course assignments. Periodic measurements are obtained and the students are given knowledge of their progress in an effort to motivate them to accomplish these work habits.

It was within this setting that special training sessions were held in relation to the present experiment. These will be discussed in a later section of this chapter.

**SUBJECTS**

The subjects used in this study were third-quarter freshman students
at The Ohio State University who were enrolled in Psychology 1, during Spring quarter, 1955.

Although ninety-eight subjects started the experiment, the final analyses, to be presented in the next chapter, are based on only seventy-four subjects, of whom thirty-two were males and forty-two were females. The remaining twenty-four subjects were eliminated from the study for the following reasons. First, it was not possible to obtain complete sets of data on twenty-two subjects, nine males and thirteen females, because these students were absent from class when the data were collected. Second, two subjects, one male and one female, withdrew from college before the experiment was completed.

The particular sample of subjects employed in this study presents a problem which warrants discussion. It should be noted that this group of students could not be considered as representative of the student-body of The Ohio State University, and there were certain characteristics of the sample which could affect the results obtained. Of these, the following are of most importance.

The average scholastic aptitude of the students who comprised this sample was considerably below that of the normal population of freshmen who enter the university. The median score attained on the Ohio State Psychological Examination (O.S.P.E.) by the group used here (N=74) ranked at the 22nd percentile when compared to scores of the freshmen norm group where the 50th percentile is the median by definition. The median score obtained by the males (N=32) ranked at the 24th percentile, while the median for the female group (N=42) ranked at the 19th percentile. From this analysis, it can be seen that the ability level of the
students in this sample was much below that of freshmen in general at The Ohio State University.

Evidence regarding the disposition of the students in this investigation was also obtained. A year after the experiment was conducted, Spring quarter, 1956, it was found that less than half of the group was enrolled and in "good" academic standing at the university. Only eleven of the male students and twenty-two of the females held this status at the end of Spring quarter, 1956. Also indicated was the fact that fifteen of the males and fourteen of the female students had been dismissed from the university because of poor scholastic standing. The balance of the group, six males and six females, either withdrew from college or did not return to the university following the completion of a given quarter's work. It is possible that such findings could reflect either lack of ability to handle college work or lack of motivation to achieve in an academic situation.

Another characteristic of this sample should be pointed out, and that is, some persons do not enroll in Psychology Hill on a completely voluntary basis. It appears that some of the students who enroll in this program do so at the advice or request of some counselor or faculty adviser at the university. There is no objective evidence of the extent to which this might have been the case in this study; however, it is generally agreed by those who supervise and instruct in the how-to-study program that this type of enrollment in the course has become more pronounced in recent quarters. Therefore, the possibility that the achievement motivation of these students may be somewhat lower than that of college freshmen in general at the university is a factor to consider.
METHOD OF MOTIVE AROUSAL

As noted previously, the experiment was conducted under two instructional conditions designed to vary the degree to which a student's need for academic achievement might be aroused. That is, an attempt was made to vary the degree to which good performance on the tasks would be interpreted by a subject as evidence of his competence in scholastic situations and social affairs in a college setting.

Task-oriented condition. First, under a Task-oriented set of instructions the experimenter made every effort to minimize the academic achievement-related cues in the situation. The purpose of these procedures preceding the administration of the test of academic achievement motivation were neither to depress nor to increase the level of motivation, but rather to keep it somewhat equivalent to the level of motivation students bring with them to an everyday classroom situation. Here, the experimenter simply pointed out how the tasks were to be performed and said he was trying out some tests on the thought processes which were in the developmental stage.

Academic Achievement-oriented condition. Second, with an Academic Achievement-oriented set of instructions the experimenter made a deliberate attempt to bring in additional academic achievement-related cues over and above those involved in the task and an everyday classroom situation. Here, the experimenter pointed out to the students that the tests they had taken previously had much more meaning than was implied before. In an effort to establish a competitive situation, the students
were told that results from a similar test given to persons at the University of Michigan indicated it was possible to predict something of a student's ability to see the relationships between things quickly, to make order out of incomplete situations, and to change rapidly so as to see things from a different point of view. It was emphasized that these abilities are some of the most important factors in competent college work. Thus, the students were informed that the results of these tests seemed to show: (a) whether or not a person could be a "top" student both scholastically and socially; and (b) whether a person tended to be respected by both professors and fellow students for the various things he or she did in college, whether it be in their class work, fraternity, sorority, or other group.¹

In light of the research by McClelland, et al (30) and a report by Allport (1) in which he points out the dimensional aspects of ego-involvement, it was assumed that the motivational changes, presumably produced by ego-involvement on the basis of these instructions, extend from low to high in the same fashion that variation in degree of motivation is produced by other operations.

**PROCEDURES FOR ESTIMATING STRENGTH OF NEED**

**FOR ACADEMIC ACHIEVEMENT**

In the following paragraphs a description of the picture interpretations test; the procedures for administering this test; and the method of content analysis employed in scoring the test protocols are presented.

¹The verbatim instructions for both conditions of motive arousal are reproduced in Appendix C.
The procedures for classifying subjects according to different levels of the need for academic achievement are also discussed.

**Picture interpretations test.** The picture interpretations test employed in this investigation consisted of six pictures drawn by an artist from the School of Fine and Applied Arts at The Ohio State University. They were designed in an attempt to suggest the possibility of study activity to a greater or lesser extent. To accomplish this objective, three pictures were of high academic cue-value and three were of low cue-value. High academic cue pictures were those with many stimulus elements in them which could be classified as instrumental, academic-related objects. Low cue pictures were those with few such stimulus elements in them.

The primary purpose for having an artist draw pictures especially for this research was that in no previous study had anyone concentrated exclusively on academic-cue pictures. Also, it has been demonstrated in earlier studies (30) that the cue-value of a picture is an important determinant of achievement scores. A group of male college students produced more achievement responses in stories about pictures of situations in which the group as a whole had had a lot of achievement training than to pictures with fewer specific stimulus cues of actual achievement-learning situations (30). The plan to design pictures for a specific area of study was also supported by R. C. Birney, who has directed research on this problem with the Wesleyan group. He believed that pictures chosen for a specific area of study would in the long run
work out best. As this was the case, more rigorous control over this variable seemed warranted, and having pictures matched on certain features, while cue-value was varied, seemed to be an improvement over the designs of previous investigations.

The three pictures of low academic cue-value can be described briefly as follows:

1. A young man is seated at a desk in the living room of his home, a picture of his girl is on the desk, and he appears to be writing.

2. Two young people are standing in the hallway of some building, apparently conversing. Another young boy is seated in a lounge chair in the background, reading.

3. Two males are seated on a park bench conversing. One appears to be older than the other.

The three pictures of high academic cue-value can be described briefly as follows:

4. A young man is seated at a desk, an open book in front of him. The scene appears to be his study room.

5. Two young people seated at a library table, looking at each other. Books and paper are on the table in front of them.

6. A father and son are talking together. Son is seated at a desk in the living room; father has his hand on his son's shoulder. Son has books open in front of him.

Reprints of the six pictures employed in the experiment are illustrated in Plate I.

Plate I. Pictures of low academic cue-value
Plate I (contd.). Pictures of high academic sue-value
Testing procedures. Group testing procedures were used in which the picture interpretations test just described was presented to the subjects by use of a slide projector and screen. Before exposing the pictures to them, the experimenter read the motive-arousal instructions. The test was administered first under the Task-oriented instructions, and after a period of two weeks, under the Academic Achievement-oriented ones. The same pictures were employed under both conditions of motive arousal. To control the variable of picture presentation sequence, and to avoid any chance of systematic biases in the design, the six pictures were exposed to the subjects in random order.

Subjects were given six $8\frac{1}{2} \times 11$ inch sheets of paper clipped together on which they were to write stories suggested by the pictures. On each sheet four sets of questions were printed. The sets of questions were spaced on the sheet so that one quarter of the page was allowed for writing about each of them. The four questions, adapted from Murray (39) and McClelland (30), were intended to insure complete coverage of a plot. They were:

1. Tell what is happening: Who are the persons?
2. Tell what happened before: What has led up to this situation?
3. Tell what is being thought and felt: By whom?
4. Tell what will happen: What will be done?

The specific procedures for the administration of the test can be summarized briefly as follows:

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As noted previously, the instructions for both conditions of motive arousal are presented in Appendix C.
The room was darkened for 20 seconds while the first picture was projected on a screen before the subjects. After 20 seconds the picture was turned off, the lights were turned on, and the subjects began writing their stories. The experimenter kept time, and after a minute had been allowed for each question, would say, "All right, it is about time to go on to the next question." When the subjects had been writing for about 30 seconds on the last question, the experimenter would say, "Try to finish up in 30 seconds." At the end of the final minute he would begin to prepare for the next picture, allowing no more than 15 seconds more than the required time for finishing the stories. The lights would be dimmed and the next picture projected on the screen for 20 seconds, and so on without interruption until all six pictures had been shown and all six stories had been written.

**Coding system for scoring the stories.** The data for each subject were recorded samples of imaginative responses. The system of coding developed for this investigation was a modification of McClelland's scoring system "C" (30) and that of Moulton for scoring "fear of failure" (37). The logic of this system was based on an application of the problem-solving sequence often applied to overt behavior. Whenever academic achievement imagery in any form appeared in a story, the behavioral sequence of an imaginative character was analyzed in the same way that an overt behavioral sequence might be analyzed. The statements by imaginative characters of a need, want, or hope for academic achievement were categorized as statements of motivation (Need). Any activity directed towards academic achievement or overcoming obstacles in the way of achieving in an academic situation were categorized Instrumental Acts, and so on. The breakdown of the imaginative thought sequence corresponding to the overt problem-solving sequence and the scoring categories are illustrated in Figure 1.

The scoring procedure consisted of two steps. In the first step...
Figure 1. The imaginative thought sequence corresponding to the overt problem-solving sequence.

*Titles of the scoring categories which were the basis for inferring the strength of academic achievement motivation from imaginative stories are listed below.*

- **AN** = Stated need for academic accomplishment
- **AN** = Stated need for help in circumventing adverse academic achievement evaluation
- **IA** = Instrumental activity leading to academic accomplishment
- **IA** = Instrumental activity leading away from academic accomplishment
- **AGa** = Anticipation of academic success
- **AGa** = Anticipation of academic failure
- **AG** = Positive emotional concomitants of academic accomplishment
- **AG** = Negative emotional concomitants of academic failure
- **ANap** = Nurturant press in an academic situation
- **AHp** = Hostile press for inadequate academic performance
- **ABp** = Personal obstacles
- **ABw** = Environmental obstacles
the scorer was to decide whether or not the story contained any reference to an Academic Achievement goal which would justify his scoring the sub-categories (Need, Instrumental Activity, and so on) as academic achievement-related. Here, the stories were scored for three imagery categories: (a) Academic Achievement Imagery (AAI); (b) Doubtful Academic Achievement Imagery (TAI); and (c) Unrelated Imagery (UI). Unrelated Imagery was assigned a score weight of zero, Doubtful Academic Achievement Imagery was scored +1, and Academic Achievement Imagery was scored +2. It was thought that these three imagery categories comprise a continuum of increasing certainty that the story contains imagery related to academic achievement motivation.

After each story had been scored for the imagery categories discussed above, those stories scored for AAI were scored further for certain Academic Achievement-related sub-categories. This scoring procedure is what comprised Step II. In this procedure a distinction was made between approach and avoidant academic achievement-related imagery. The approach and avoidant features of these sub-categories were assigned a score weight of +1 and were scored only once per story.\(^4\)

The total \( n \) Academic Achievement score for any one individual was the total of the scores obtained on all six stories written. This index was obtained by summing the category scores, AAI, TAI, UI, and the academic achievement-related sub-categories, for the six stories written. It was recognized, as stated in the literature regarding this

\( ^4 \) The scoring manual, including a detailed description of the various imagery categories and sub-categories, together with illustrative examples of stories scored by this method of analysis, is reproduced in Appendix D.
method of content analysis (30), that this scoring system could only represent a rough index of the intensity level of need for academic achievement. However, it was assumed that for experimental purposes, this index ought to give a somewhat valid High-Middle-Low breakdown of motivation level even though it may not be free of imperfections at this stage of development.

**Classification of subjects according to level of academic achievement motivation.** The subjects of this experiment were grouped as to High, Medium, and Low need for academic achievement on the basis of academic achievement scores as inferred from their picture interpretations test protocols. To explore the question of whether or not this particular measure of the need for academic achievement is related to performance in learning certain skills, it was decided to compute indices of this need in several different ways.

First, a Total n Academic Achievement score was determined for each subject from the stories they wrote under the Task-oriented instructional condition. Second, a Total n Academic Achievement score was calculated for each subject from the stories they wrote under the Academic Achievement-oriented instructional condition. To obtain an index of the score gradient between these two instructional conditions, a Total n Academic Achievement Gradient score was computed by subtracting the total score obtained under the Task-oriented condition from that obtained under the Academic Achievement-oriented condition. As pointed out in Chapter II, research (30) indicated that in attempting to predict the excellence of performance when achievement-cues are present, such as
in a classroom situation, the difference in \( n \) Achievement scores between Task- and Achievement-oriented conditions might be the best measure of sensitivity to the demands of the situation. For this reason, and since the present research is of an exploratory nature, it seemed worthwhile to include a gradient index of motivation in the analysis of data.

Apart from the three indices of need for academic achievement just covered, two additional measures were calculated for each subject. The differences between groups classified according to these measures of motivational level on their performance in learning the skills in question were analyzed so as to control the possibility of the occurrence of findings in this study similar to those reported in previous work by McClelland and his associates (30). Frequently appearing in the extensive research with the \( n \) Achievement instrument have been curvilinear relationships between \( n \) Achievement scores and various measures of instrumental behavior (3, 4, 5). Often the mid-third of the \( n \) Achievement distribution was found to perform instrumental tasks less efficiently than did the lower third. Also, a study by Clark and McClelland (10) has suggested that a two factor theory of achievement motivation is of great probable value. They factor analyzed the \( n \) Achievement scores of a large group of subjects and obtained tetrachoric correlations between each sub-category in the scoring procedure. Their analysis showed as expected, two clearly defined factors. One appeared to be an approach motive or hope of success factor, which was composed of the sub-categories—successful instrumental activity, anticipations of success, the positive emotional concomitants of successful competition with a standard of excellence, and external help in furthering goal attainment.
The other factor consisted of the negative counterparts of the positive categories plus the several categories which defined obstacles to the achievement sequence. These sub-categories are similar to those included in Step II of the scoring procedure employed in the present study.

Since it seemed probable that individuals motivated primarily by a fear of academic failure, would differ on performance in learning the skills involved in this study, from those persons motivated by a hope of academic success, the experimenter decided to incorporate a measure of \( \pi \) Academic Achievement which would take into account the function of these motives. This measure was termed a Total \( \pi \) Academic Achievement Approach Tendency score.

Two such scores were computed for each subject. One, a Total \( \pi \) Academic Achievement Approach Tendency score was calculated from the stories written under the Task-oriented set of instructions. Two, a similar score was derived from the stories written under the Academic Achievement-oriented condition. The scores were determined as follows. The approach features of the sub-categories in Step II of the scoring manual were assigned score weights of plus one (+1). The avoidant features of these categories were given a score weight of minus one (-1). The Total \( \pi \) Academic Achievement Approach Tendency scores represented a summation of the numerical weights of the three imagery categories in Step I of the scoring procedures, AAI, TAI, and UI, plus the algebraic summation of the approach-avoidant features of the academic achievement-related sub-categories in Step II. The total score for any one individual was the total of all scores obtained from the six stories written.
PROCEDURES FOR OBTAINING PERFORMANCE MEASURES ON SKILL VARIABLES

The procedures for the administration and scoring of tests, the methods of obtaining work samples of notes, and the procedures for computing ratings on the performance levels on these tasks are presented in this section.

Scrambled words task. As noted in Chapter II this task was included in the design of this study in the hope of obtaining an alternative and more immediate measure of performance from which the effects of the need for academic achievement in learning a verbal task might be observed. It was hoped that this analysis might shed light on possible differences between immediate and longitudinal measures of performance in learning as they relate to need for academic achievement.

A Scrambled Words test which consisted of a series of four-, five-, and six-letter disarranged words was used. The pages of scrambled words employed here were eight pages of the ten used by Lowell (25) in his research. As indicated in Chapter II, these words had been selected from the first 500 most frequently used words in the Thorndike-Lorge Word List. Lowell had arranged them on different pages in different orders and they were reproduced twenty-four to a page.

The test administered under the Task-oriented condition consisted of two pages of such words, and was administered with the following directions:
On the following pages you'll find common words that have been scrambled by changing the order of the letters. Try to make a word out of the letters and write it in the space on the right.

Example: W T S E west

If you find any of these words difficult to un-scramble, skip them and go on to the next.

You may go ahead whenever ready and take about ten minutes or so to try them out.

This test was not timed so as to avoid the possibility of giving the subjects a set to try to do their best. Rather, the instructions were designed to give an impression to the subjects that they were merely expected to try out the test. No mention was made as to what would represent a good or poor performance, and excellence of performance was not evaluated on this task.

The test administered under the Academic Achievement-oriented condition consisted of a series of six pages of such words arranged in random order. They were also distributed among subjects randomly. These procedures were followed in order to randomize any differences in difficulty at successive testing periods. This test was administered with the following instructions:

On the following pages you'll find common words that have been scrambled by changing the order of the letters. Try to make a word out of the letters and write it in the space on the right.

Example: W T S E west

If you find any of these words difficult to un-scramble, skip them and go on to the next. You may have an opportunity later.

5Copies of these tests are reproduced in Appendix C.
to come back and work on the ones you find difficult.

PLEASE DON'T START UNTIL THE SIGNAL IS GIVEN AND TURN THE PAGES PROMPTLY (AND ONLY WHEN) INSTRUCTED TO DO SO.

You're not expected to be able to complete all the words in the allotted time, but do as many as you can. You'll have about a minute and a half per page.

As in Lowell's study, the tests were administered after the subjects had responded to the picture interpretations test. This arrangement was planned so as to avoid the possibility of contaminating the protocols of the thematic records with subjects' feelings of success or failure which could result from the task-performance itself.

An index of improvement in performance on this task was obtained for each subject. This was obtained by computing difference scores for the number of words correctly unscrambled between the first and last three-minute work periods of the test situation.

**Study skills.** The study skills on which subjects received training were: (a) reading rate and comprehension accuracy, and (b) quality of notes and working rate while reading and taking notes.

One of the purposes of Psychology 411 is to help students improve reading rate and comprehension accuracy. A series of laboratory experiences are provided to aid in the development of these skills (44). Although no attempts to control the operation and mechanics of these training sessions were instigated by the experimenter, it was decided to include a measure of improvement in these skills as a criterion for the present study.

An index of improvement in performance on these skills was obtained
for each subject by computing difference scores between the scores obtained at the beginning and at the end of the quarter on both reading rate and comprehension accuracy. These data were obtained from administration of the Robinson-Hall Canadian History and Russian History Reading Tests (145). In all sections of the course, but one, the Canadian History test was administered during the first week of the quarter and the Russian History test during the final week. In the one section the tests were administered in reverse order. The students were instructed to read the material in their usual manner, at the initial testing session. However, at the final testing session they were instructed to read the material and try to use the skills they had learned throughout the quarter.

A measure of improvement on note-taking skills was obtained by employing the following procedures. A series of five training sessions in note-taking skills was conducted at two-week intervals throughout the quarter. The primary purpose of these training periods was to help students develop skills by which they could take meaningful and systematic notes in outline form while working at an efficient rate. The note-taking technique taught was that presented by F. P. Robinson in his text, Effective Study (144). This system consisted of the following steps: (a) making a preview of the chapter headings and final summary before starting to read so as to select and comprehend what is important; (b) asking oneself questions based on the heading as one starts to read each headed section; and (c) writing brief summary phrases in outline form after reading each section so as to check one's comprehension and to picture the relationship among the ideas presented. To
promote easy visualization of the main ideas, the students were instructed to use as few summary phrases as possible; to use abbreviations to shorten lengthy words; and to label and indent their note material so that the major points of the article would stand out from the more minor subpoints.

The instruction the students received in these outlining skills was conducted by the instructors in charge of the course. The role of the experimenter was that of supervising the mechanics of the training periods and providing the instructors with information about the performance of their students relative to that of those in other classes of the course. The experimenter, however, made every attempt to maintain standard procedures in the operation of these training sessions for all sections of Psychology 411.6

The material the students were to read, and on which they were to take notes, was selected from a typical political science textbook. The text used was that by Burns and Peltason, *Government by the People* (8). Five selections were chosen from various parts of this text, and each was approximately 3,000 words in length.7 These selections were presented to the students in random order so as to control the variable of presentation sequence and to avoid the possibility of contaminating the results of the research with systematic biases which might be attributed to difficulty level of the selections.

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6A copy of the training manual given to each instructor is reproduced in Appendix B.

Students were given from twenty to twenty-five minutes to read and take notes on each selection. The time allotted varied with the length of the selection and the amount of time instructors thought they could devote to this training. In no case were the training periods cut so short that adequate samples of notes could not be obtained.

The initial sample of notes was obtained from the students within the first two weeks of the quarter. The instructions given to the students at this time were to read and take notes in their usual way. This sample was to serve as the basis for obtaining an estimate of their improvement in these skills as a result of the training they were to receive. When these notes were returned to the students a few days later, however, they had been rated in a rough manner for general appearance, use of an outline scheme, and meaningfulness. At the same time, a manual explaining the rating procedure and its purpose was given to each student. Also, a sample set of notes over the article concerned, which was designed to illustrate "good quality" notes, was presented to them for observation and comparison purposes. At this class meeting the instructors also devoted some time to the topic of developing effective outlining skills, and the students were informed that there would be a series of four practice periods similar to this one throughout the quarter.

The instructions from this point forth were designed to motivate the students for academic achievement in these study skills. To

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8 The first and last selection in the series were somewhat longer than the others; therefore, the working time was increased from twenty to twenty-five minutes on these selections.
accomplish this, it was pointed out to them that proficiency in these skills is quite important for success in college work, and they were urged by their instructors to do their very best at each of the practice periods to follow because the instructors would be interested in seeing how much and how rapidly they could improve in these skills. The instructors also told them that they would consider the students' performance at these sessions as the "best" measure of the extent to which they had developed a use of these study skills.

During the succeeding practice periods, then, the following sequence of events took place: (a) a sample of notes over an article on political science was obtained from each student; (b) the experimenter rated these for general appearance, use of an outline scheme, and meaningfulness; (c) the notes were returned to the students within a week so that students would have knowledge of their performance; (d) the students compared their notes with a sample set of notes over the same article; and (e) instruction in those points which seemed important for becoming more proficient in these skills was offered by their instructors.

An index of improvement in performance on these skills was obtained for each subject by computing difference scores on a rating of quality of notes and a record of working rate (number of words covered per minute while reading and taking notes) between the initial and final practice periods during the quarter.

In concluding the discussion of the procedures employed in obtaining measures of students' performance in learning these study skills, it is necessary to point out that at no time during the training period did
the experimenter or the instructors make the students aware of the fact that their performance on these skills would be studied in relation to their performance on the Picture Interpretations Test. It was not until the final week of the course that they were informed by their instructors that these training periods had been part of the experimenter's research project. At that time they were told the purpose of the experiment and they were thanked for their cooperation in the project.

**DESIGN FOR THE ANALYSES OF DATA**

The significance of differences on performance in learning the skills just discussed between subjects who demonstrated high, medium, and low level of the need for academic achievement was determined. These analyses were made on groups who had been matched on: (a) initial level of performance on the particular skill in question; (b) verbal ability; and (c) length of time exposed to college experiences. The latter variable was controlled by using subjects all of whom were third-quarter freshmen students at The Ohio State University. Their level of verbal ability was based on their performance on the Ohio State University Psychological Examination (O.S.P.E.), a scholastic aptitude test. Since in previous research (30, 53) sex differences had been found with respect to subjects' performance on the measures of achievement motivation, the data of this study were analyzed separately for each sex.

A t test of significance between correlated means was employed to determine the significance of differences on performance in learning to unscramble words on a Scrambled Words task between the groups of
different levels of academic achievement motivation.

In order to determine the significance of differences on performance in learning reading and note-taking skills between groups who demonstrated different levels of the need for academic achievement, a $\chi^2$ test of significance, as described by Hald (18), was used. This statistical test seemed to be the most appropriate procedure for treating the data because in this study it was necessary to determine the significance of differences between two sets of two-dimensional observations. A discussion of this method will be presented in the next chapter.

An analysis was made of the effects of the determinants of Academic Achievement score by employing a $2 \times 2$ factorial design of analysis of variance.

The score-rescore consistency and the inter-scorer agreement of those who judged the protocols of the picture interpretations test was established.\(^9\) Also, the reliability of the raters who handled the data regarding the rating of quality of notes was determined.\(^10\)

The results of these analyses will be discussed in the next chapter.

\(^9\)A high degree of consistency was found between judges, and also on the part of the investigator himself, on scoring the protocols of the picture interpretations test for academic achievement imagery. Reliability data are presented in Chapter IV, pg. 98.

\(^10\)There was a high degree of consistency between scorers and also on the part of the raters themselves on scoring notes for quality characteristics. These data are given in Chapter IV, pg. 101.
CHAPTER IV

PRESENTATION OF RESULTS

The chief concern of the analyses of data presented in this chapter is to answer the question: Do subjects who differ in level of need for academic achievement, as inferred from fantasy productions to a picture interpretations test, show significantly different performance in learning reading and note-taking skills?

Certain other analyses will also be presented. Namely, one, an analysis of the differences on performance in learning to unscramble words will be discussed. Two, an analysis of the effects of the determinants of Academic Achievement score will be shown. Three, the score-rescore consistency and the inter-scorer agreement of those who judged the protocols of the picture interpretations test will be established. Finally, the reliability of the raters who handled the data regarding the rating of quality of notes will be indicated.

In this chapter, then, the analyses of major concern will be presented first, followed by those of less importance.

RESULTS OF MAJOR CONCERN

The general hypothesis with respect to these analyses of data is: There are no significant differences on performance in learning reading and note-taking skills between groups of subjects who show various levels of the need for academic achievement.

Method of analysis. In order to determine the significance of
differences on performance in learning reading and note-taking skills between groups of subjects who demonstrate different levels of the need for academic achievement, the $v^2$ test of significance, as described by Hald (18), was employed.

This statistical test seemed to be the most appropriate procedure for treating the data because in this study it was necessary to determine the significance of differences on reading rate and comprehension accuracy, on the one hand, and working rate and note quality, on the other, between groups of different levels of need for academic achievement.

The $v^2$ test is used when the theoretical normal distribution surface, of the performance variables under study, is conceived as being two-dimensional in character. Here, Hald explains, the simplest model of a two-dimensional relationship between variables is a functional relationship; where the operation of one variable is influenced to some extent by the operation of the other. This seemed to be the case in the present investigation. It was found that reading rate influences to some degree the level of comprehension accuracy attained by a subject. Likewise, a person's working rate (the number of words covered while reading and taking notes) determines to a certain extent the quality of notes taken. For these reasons, then, the $v^2$ test, which gives an estimate of the relationship between the performance variables involved, was employed.

The expression of $v^2$, as described by Hald (18), is written as
follows:

\[ v^2 (2, n_1 + n_2 - 3) = \frac{n_1 + n_2 - 3}{n_1 - n_2 - 2} \cdot \frac{T^2}{2}. \]  \hspace{1cm} (1)

where

\[ T^2 = \frac{1}{1 - r_{12}^2} \left( t_1^2 - 2r_{12}t_1t_2 + t_2^2 \right). \]  \hspace{1cm} (2)

This relation given above, according to Hald (18), shows the difference between the application of two marginal tests and a joint test based on a two-dimensional distribution. The two-dimensional distributions with respect to this study are: (a) a distribution of reading rate and comprehension accuracy scores, and (b) a distribution of working rate and note quality scores. Thus, the question of primary statistical concern becomes: Can the two sets of performance measures, e.g., one set originating from a group of students showing low motivation for academic achievement and another from a group highly motivated, be considered as originating from the same two-dimensional normally distributed population? This is a test for the hypothesis that two pairs of population means are identical, assuming that the two sets of observations have the same theoretical variances and correlation coefficients (18). The test is based on the two differences between means of the difference scores for the group comparisons in question, low vs. medium, low vs. high, and medium vs. high motivation levels. If \( v^2 \) is significant, that is, if the

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\(^1\)In the present study, difference scores were calculated for each subject by subtracting the performance score obtained on the initial measurement from that obtained on the final measurement.
differences between the means of the difference scores deviate significantly from zero, the test hypothesis can be rejected.

The $\chi^2$ values obtained from the analyses made on the data of this study were interpreted on the basis of a Table of $\chi^2$ values in Hald's *Statistical Tables and Formulas* (19). If the values obtained are found to be significant at the 5% level of confidence, then the test hypothesis can be rejected, and it might be concluded that the groups of subjects who demonstrated different levels of need for academic achievement performed differently in learning the study skills in question.

To compute the significance of differences on performance in learning reading and note-taking skills between groups of different levels of need the following procedures were followed. First, level of need for academic achievement was inferred from stories written to the picture interpretations test and the $n$ Academic Achievement score for each subject was computed. Subjects were then classified into three groups, high, medium, and low motive level. The breakdown into groups was made by dividing the distributions of the several different indices of $n$ Academic Achievement into thirds. Next, subjects were matched as closely as possible with respect to verbal ability and initial level of performance in these skills. Finally, difference scores were calculated for each subject in the various groups by subtracting the performance scores obtained on the initial measurement of the variable from that

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2 The descriptive statistics with respect to the measures of verbal ability (O.S.P.E.), $n$ Academic Achievement and the reading and note-taking tasks for both male and female subjects are presented in Appendix A, Tables XXX, XXXI, XXXII, XXXIII, XXXIV, XXXV, XXXVI, XXXVII, and XXXVIII.

3 Subjects were classified into three groups of different levels of motivation on the basis of the several different indices of $n$ Academic Achievement discussed in Chapter III, pp. 43-45.
obtained on the final measurement. The significance of differences was determined by computing the \( t^2 \) values of differences between means of the difference scores for the group comparisons in question.

**Results of analysis.** Comparisons of differences on performance in learning reading and note-taking skills at initial and final testing periods between subjects showing different levels of academic achievement motivation are presented in Tables I through XX. Tables I through V represent comparisons of differences on reading skills between groups of male college students of different levels of motivation for academic achievement who had been matched with respect to verbal ability (O.S.P.E.) and initial level of performance on reading rate and comprehension accuracy. Tables VI through X represent comparisons of differences on reading skills between matched groups of female college students who, likewise, had demonstrated different levels of academic achievement motivation. Tables XI through XV represent comparisons of differences on note-taking skills between groups of male college students of different motive levels who had been matched with respect to verbal ability and initial level of performance on working rate and quality of notes. Tables XVI through XX show the results of comparisons of differences on note-taking skills between matched groups of female students of different motive levels.

In these Tables the mean performance measures for the variables concerned, the mean differences between initial and final testing on them, the differences between means of the difference scores for the various group comparisons, the correlation between the variables, and
### TABLE I

**A COMPARISON OF DIFFERENCES ON READING SKILLS BETWEEN MALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean $O_3,S_3,P_3,E_3$</th>
<th>Reading rate</th>
<th>Reading rate $K_P$</th>
<th>Comprehension accuracy</th>
<th>Comprehension accuracy $K_P$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Initial</td>
<td>Final</td>
<td>Initial</td>
<td>Final</td>
</tr>
<tr>
<td>Low $\mu$ Academic Achievement ($N = 9$)</td>
<td>51.6</td>
<td>48.6</td>
<td>48.0</td>
<td>0.6</td>
<td>51.3</td>
</tr>
<tr>
<td>Medium $\mu$ Academic Achievement ($N = 9$)</td>
<td>52.7</td>
<td>50.2</td>
<td>52.2</td>
<td>2.0</td>
<td>51.2</td>
</tr>
<tr>
<td>High $\mu$ Academic Achievement ($N = 9$)</td>
<td>47.1</td>
<td>48.6</td>
<td>49.4</td>
<td>0.8</td>
<td>49.4</td>
</tr>
</tbody>
</table>

**Difference between means:**

<table>
<thead>
<tr>
<th>Group comparison</th>
<th>$r^b$</th>
<th>Reading rate</th>
<th>Comprehension accuracy</th>
<th>$v^2$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low vs Medium</td>
<td>0.237</td>
<td>2.45</td>
<td>4.06</td>
<td>0.672</td>
</tr>
<tr>
<td>Low vs High</td>
<td>0.227</td>
<td>1.42</td>
<td>5.01</td>
<td>0.601</td>
</tr>
<tr>
<td>Medium vs High</td>
<td>0.390</td>
<td>1.2</td>
<td>0.5</td>
<td>0.085</td>
</tr>
</tbody>
</table>

Notes: Level of need for academic achievement was inferred from Total $\mu$ Academic Achievement scores obtained from stories written under task-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability ($O_3,S_3,P_3,E_3$) and on initial level of performance on the reading task. Five (5) subjects of the total group of third-quarter freshmen ($N = 32$) were eliminated because appropriate matching could not be accomplished.

$a$ Performance measures with respect to reading skills were obtained at initial and final testing periods on the Robinson Hall Canadian and Russian History Reading Tests. Reading rate refers to the mean number of words read per minute. Comprehension accuracy refers to the mean accuracy scores computed by dividing number of questions answered correctly by the number tried. Raw scores were converted to $T$-scores for this analysis.

$^b$ Correlation between reading rate and comprehension accuracy scores.

$^c$ Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.

$^d$ These letters signify that the comparison was not statistically significant.
A COMPARISON OF DIFFERENCES ON READING SKILLS
BETWEEN MALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Initial O.S.P.E</th>
<th>Mean Final O.S.P.E</th>
<th>Comprehension accuracy Initial</th>
<th>Comprehension accuracy Final</th>
<th>Initial Reading rate</th>
<th>Final Reading rate</th>
<th>Mean Difference</th>
<th>t-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Academic Achievement</td>
<td>49.3</td>
<td>46.2</td>
<td>3.2</td>
<td>4.4</td>
<td>49.4</td>
<td>46.9</td>
<td>0.5</td>
<td>3.988</td>
</tr>
<tr>
<td>Medium Academic Achievement</td>
<td>53.4</td>
<td>50.9</td>
<td>3.1</td>
<td>4.9</td>
<td>47.8</td>
<td>50.3</td>
<td>2.5</td>
<td>1.755</td>
</tr>
<tr>
<td>High Academic Achievement</td>
<td>50.1</td>
<td>50.5</td>
<td>1.9</td>
<td>4.9</td>
<td>52.4</td>
<td>51.0</td>
<td>0.4</td>
<td>1.460</td>
</tr>
</tbody>
</table>

Note: Level of need for academic achievement was inferred from Total O.S.P.E. scores obtained from stories written under academic-achievement-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (O.S.P.E.) and on initial level of performance on the reading task. Five (5) subjects of the total group of third-quarter freshman (N = 32) were eliminated because appropriate matching could not be accomplished.

*Performance measures with respect to reading skills were obtained at initial and final testing periods on the Robinson-Hall Canadian and Russian History Reading Tests. Reading rate refers to the mean number of words read per minute. Comprehension accuracy refers to the mean accuracy scores computed by dividing number of questions answered correctly by the number tried. Raw scores were converted to T-scores for this analysis.

*bCorrelation between reading rate and comprehension accuracy scores.

*cDifferences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.

*dThe observed differences between means of the difference scores on performance in learning reading skills between subjects who demonstrated low vs medium levels of the need for academic achievement is statistically significant at beyond the 5% level of confidence.
### TABLE III

**A COMPARISON OF DIFFERENCES ON READING SKILLS BETWEEN MALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Reading Rate</th>
<th>Comprehension Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial</td>
<td>Final</td>
</tr>
<tr>
<td>Low n Academic Achievement ($N = 9$)</td>
<td>48.2</td>
<td>52.0</td>
</tr>
<tr>
<td>Medium n Academic Achievement ($N = 9$)</td>
<td>42.1</td>
<td>53.2</td>
</tr>
<tr>
<td>High n Academic Achievement ($N = 9$)</td>
<td>48.2</td>
<td>49.7</td>
</tr>
</tbody>
</table>

**Group comparisons:**

<table>
<thead>
<tr>
<th>Group comparisons</th>
<th>$r^b$</th>
<th>Reading rate</th>
<th>Comprehension accuracy</th>
<th>$r^2$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low vs Medium</td>
<td>0.029</td>
<td>5.6</td>
<td>1.7</td>
<td>1.169 n.s.</td>
</tr>
<tr>
<td>Low vs High</td>
<td>0.355</td>
<td>0.7</td>
<td>6.5</td>
<td>0.574 n.s.</td>
</tr>
<tr>
<td>Medium vs High</td>
<td>0.109</td>
<td>4.9</td>
<td>4.8</td>
<td>1.805 n.s.</td>
</tr>
</tbody>
</table>

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**Note:** Level of need for academic achievement was inferred from Total n Academic Achievement Approach Tendency scores obtained from stories written under Task-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability ($G_{5097}$) and on initial level of performance on the reading task. Five (5) subjects of the total group of third-quarter freshmen ($N = 32$) were eliminated because appropriate matching could not be accomplished.

$^a$Performance measures with respect to reading skills were obtained at initial and final testing periods on the Robinson-Hall Canadian History and Russian History Reading Tests. Reading rate refers to the mean number of words read per minute. Comprehension accuracy refers to the mean accuracy scores computed by dividing number of questions answered correctly by the number tried. Raw scores were converted to $t$-scores for this analysis.

$^b$Correlation between reading rate and comprehension accuracy scores.

$^c$Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
### TABLE IV

**A COMPARISON OF DIFFERENCES ON READING SKILLS BETWEEN MALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION**

<table>
<thead>
<tr>
<th>Group</th>
<th>Academic Achievement</th>
<th>N</th>
<th>Mean Reading Rate</th>
<th>Comprehension Accuracy</th>
<th>Group Comparison</th>
<th>Reading Rate Δ</th>
<th>Comprehension Accuracy Δ</th>
<th>χ² Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low A</td>
<td>Academic Achievement</td>
<td>10</td>
<td>46.2</td>
<td>50.1</td>
<td>Low A vs Medium A</td>
<td>-2.76</td>
<td>-8.3</td>
<td>1.792</td>
</tr>
<tr>
<td>Low B</td>
<td>Academic Achievement</td>
<td>8</td>
<td>50.4</td>
<td>54.9</td>
<td>Low B vs High</td>
<td>-4.23</td>
<td>-8.1</td>
<td>2.856</td>
</tr>
<tr>
<td>Medium A</td>
<td>Academic Achievement</td>
<td>10</td>
<td>47.0</td>
<td>52.0</td>
<td>Medium A vs High</td>
<td>-4.94</td>
<td>-1.4</td>
<td>0.214</td>
</tr>
</tbody>
</table>

**Note:** Level of need for academic achievement was inferred from Total Academic Achievement Approach Tendency scores obtained from stories written under Academic Achievement-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (0.3S.P.E) and initial level of performance on the reading task. Three (3) subjects of the total group of third-quarter freshmen (N = 32) were eliminated because appropriate matching could not be accomplished.

- **Reading rate** refers to the mean number of words read per minute. Comprehension accuracy refers to the mean accuracy scores computed by dividing number of questions answered correctly by the number tried. Raw scores were converted to T-scores for this analysis.

- **Correlation between reading rate and comprehension accuracy scores.**

- **Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.**

- **Statistically significant at beyond the 10% level of confidence.**
A COMPARISON OF DIFFERENCES ON READING SKILLS BETWEEN MALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean O.S.P.E</th>
<th>Reading rate</th>
<th>Comprehension accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Initial</td>
<td>Final</td>
</tr>
<tr>
<td>Low A Academic Achievement (N = 11)</td>
<td></td>
<td>47.0</td>
<td>52.0</td>
</tr>
<tr>
<td>Low B Academic Achievement (N = 8)</td>
<td></td>
<td>53.5</td>
<td>46.5</td>
</tr>
<tr>
<td>Medium A Academic Achievement (N = 11)</td>
<td></td>
<td>48.0</td>
<td>53.0</td>
</tr>
<tr>
<td>Medium B Academic Achievement (N = 8)</td>
<td></td>
<td>53.0</td>
<td>51.0</td>
</tr>
<tr>
<td>High A Academic Achievement (N = 8)</td>
<td></td>
<td>51.5</td>
<td>46.3</td>
</tr>
</tbody>
</table>

**Group comparisons:**

- Low A vs Medium A: \( p = 0.259 \)
- Low B vs High: \( p = 0.123 \)
- Medium B vs High: \( p = 0.157 \)

**Difference between means:**

- Reading rate: \( \chi^2 = 0.7 \) p = 0.61
- Comprehension accuracy: \( \chi^2 = 0.6 \) p = 0.58

**Notes:**

- Level of need for academic achievement was inferred from Total Academic Achievement Gradient scores. Low level of need represents the persons who had lower Academic Achievement scores under Academic Achievement-oriented instructions than under Task-oriented instructions. The medium group neither gained nor lost in Academic Achievement scores between the two instructional conditions. The high group obtained higher Academic Achievement scores on stories written under Academic Achievement-oriented instructions than on those written under Task-oriented condition. Subjects were matched as closely as possible with respect to verbal ability (O.S.P.E) and on initial level of performance on the reading task. One subject of the total group of third-quarter freshmen \( (N = 32) \) was eliminated because appropriate matching could not be accomplished.

- Performance measures with respect to reading skills were obtained at initial and final testing periods on the Robinson-Hall Canadian and Russian History Reading Tests. Reading rate refers to the mean number of words read per minute. Comprehension accuracy refers to the mean accuracy scores computed by dividing number of questions answered correctly by the number tried. Raw scores were converted to T-scores for this analysis.

- Correlation between reading rate and comprehension accuracy scores.

- Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.

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"TABU! V"
### TABLE VI

**A COMPARISON OF DIFFERENCES ON READING SKILLS**
**BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Initial</th>
<th>Reading Rate</th>
<th>Comprehension Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Academic Achievement</td>
<td>52.8</td>
<td>50.8</td>
<td>50.4</td>
</tr>
<tr>
<td>Medium Academic Achievement</td>
<td>51.9</td>
<td>52.3</td>
<td>50.7</td>
</tr>
<tr>
<td>High Academic Achievement</td>
<td>51.2</td>
<td>50.8</td>
<td>49.2</td>
</tr>
</tbody>
</table>

**Note:** Level of need for academic achievement was inferred from Total Academic Achievement scores obtained from stories written under Task-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (O.S.P.E.) and on initial level of performance on the reading task. Twelve (12) subjects of the total group of third-quarter freshmen (N = 42) were eliminated because appropriate matching could not be accomplished.

**Performance measures with respect to reading skills were obtained at initial and final testing periods on the Robinson-Hall Canadian and Russian History Reading Tests.** Reading rate refers to the mean number of words read per minute. Comprehension accuracy refers to the mean accuracy scores computed by dividing number of questions answered correctly by the number tried. Raw scores were converted to T-scores for this analysis.

**b** Correlation between reading rate and comprehension accuracy scores.

**c** Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
### TABLE VII

**A COMPARISON OF DIFFERENCES ON READING SKILLS BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Initial</th>
<th>Mean Final</th>
<th>M&lt;sub&gt;D&lt;/sub&gt;</th>
<th>Comprehension accuracy Initial</th>
<th>Comprehension accuracy Final</th>
<th>M&lt;sub&gt;D&lt;/sub&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Academic Achievement</td>
<td>58.1</td>
<td>50.3</td>
<td>50.0</td>
<td>51.8</td>
<td>53.5</td>
<td>1.7</td>
</tr>
<tr>
<td>Medium Academic Achievement</td>
<td>55.3</td>
<td>52.6</td>
<td>50.1</td>
<td>50.8</td>
<td>48.6</td>
<td>2.2</td>
</tr>
<tr>
<td>High Academic Achievement</td>
<td>57.9</td>
<td>50.3</td>
<td>50.4</td>
<td>48.8</td>
<td>51.1</td>
<td>2.3</td>
</tr>
</tbody>
</table>

#### Group comparisons

<table>
<thead>
<tr>
<th>Group comparisons</th>
<th>Reading rate</th>
<th>Comprehension accuracy</th>
<th>( \chi^2 ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low vs Medium</td>
<td>0.06</td>
<td>3.9</td>
<td>0.0390</td>
</tr>
<tr>
<td>Low vs High</td>
<td>0.159</td>
<td>0.6</td>
<td>0.015</td>
</tr>
<tr>
<td>Medium vs High</td>
<td>0.234</td>
<td>4.5</td>
<td>0.034</td>
</tr>
</tbody>
</table>

**Notes:**
- Level of need for academic achievement was inferred from Total Academic Achievement scores obtained from stories written under Academic Achievement-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (O.S.P.E) and on initial level of performance on the reading task. Six (6) subjects of the total group of third-quarter freshmen (N = 42) were eliminated because appropriate matching could not be accomplished.

- Performance measures with respect to reading skills were obtained at initial and final testing periods on the Robinson-Hall Canadian and Russian History Reading Tests. Reading rate refers to the mean number of words read per minute. Comprehension accuracy refers to the mean accuracy scores computed by dividing number of questions answered correctly by the number tried. Raw scores were converted to T-scores for this analysis.

- Correlation between reading rate and comprehension accuracy scores.

- Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
### TABLE VIII

**A COMPARISON OF DIFFERENCES ON READING SKILLS**
**BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean ( O_{SP} F_{e} )</th>
<th>Reading rate</th>
<th>Comprehension accuracy</th>
<th>Difference between means</th>
<th>( \chi^2 ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial</td>
<td>Final</td>
<td>Initial</td>
<td>Final</td>
<td></td>
</tr>
<tr>
<td>Low Academic Achievement ( N = 10 )</td>
<td>52.7</td>
<td>50.7</td>
<td>51.3</td>
<td>0.6</td>
<td>= 4.4</td>
</tr>
<tr>
<td>Medium Academic Achievement ( N = 10 )</td>
<td>50.0</td>
<td>50.4</td>
<td>50.5</td>
<td>0.4</td>
<td>= 0.8</td>
</tr>
<tr>
<td>High Academic Achievement ( N = 10 )</td>
<td>52.6</td>
<td>49.5</td>
<td>50.0</td>
<td>0.5</td>
<td>2.0</td>
</tr>
</tbody>
</table>

**Group comparisons**

<table>
<thead>
<tr>
<th>Group comparisons</th>
<th>( r^b )</th>
<th>Reading rate</th>
<th>Comprehension accuracy</th>
<th>( \chi^2 ) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low vs Medium</td>
<td>-0.26</td>
<td>= 3.6</td>
<td></td>
<td>0.296 n.s.</td>
</tr>
<tr>
<td>Low vs High</td>
<td>-0.19</td>
<td>= 6.4</td>
<td></td>
<td>0.612 n.s.</td>
</tr>
<tr>
<td>Medium vs High</td>
<td>-0.37</td>
<td>= 2.8</td>
<td></td>
<td>0.294 n.s.</td>
</tr>
</tbody>
</table>

**Notes:**
- Level of need for academic achievement was inferred from Total \( O_5 P_{Fe} \) Academic Achievement Approach Tendency scores obtained from stories written under Task-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability \( O_5 P_{Fe} \) and on initial level of performance on the reading task. Twelve (12) subjects of the total group of third-quarter freshmen \( N = 42 \) were eliminated because appropriate matching could not be accomplished.
- Performance measures with respect to reading skills were obtained at initial and final testing periods on the Robinson Hall Canadian and Russian History Reading Tests. Reading rate refers to the mean number of words read per minute. Comprehension accuracy refers to the mean accuracy scores computed by dividing number of questions answered correctly by the number tried. Raw scores were converted to \( T \)-scores for this analysis.
- Correlation between reading rate and comprehension accuracy scores.
- Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
A COMPARISON OF DIFFERENCES ON READING SKILLS
BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean O_{3.5.3.5.0}</th>
<th>Reading rate</th>
<th>Comprehension accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial</td>
<td>Final</td>
<td></td>
</tr>
<tr>
<td>Low Academic Achievement (N = 12)</td>
<td>49.4</td>
<td>50.3</td>
<td>53.1</td>
</tr>
<tr>
<td>Medium Academic Achievement (N = 12)</td>
<td>51.3</td>
<td>49.9</td>
<td>47.6</td>
</tr>
<tr>
<td>High Academic Achievement (N = 12)</td>
<td>49.8</td>
<td>49.3</td>
<td>48.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group comparison</th>
<th>r^b</th>
<th>Difference between means</th>
<th>v^2 value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low vs Medium</td>
<td>- .022</td>
<td>5.1</td>
<td>4.5</td>
</tr>
<tr>
<td>Low vs High</td>
<td>- .296</td>
<td>3.7</td>
<td>6.2</td>
</tr>
<tr>
<td>Medium vs High</td>
<td>- .034</td>
<td>1.4</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Note: Level of need for academic achievement was inferred from total O Academic Achievement Approach Tendency scores obtained from stories written under Academic Achievement-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (O_{3.5.3.5.0}) and an initial level of performance on the reading task. Six (6) subjects of the total group of third-quarter freshmen (N = 42) were eliminated because appropriate matching could not be accomplished.

^b Correlation between reading rate and comprehension accuracy scores.

^* Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
<table>
<thead>
<tr>
<th>Group</th>
<th>Mean $\bar{X}$</th>
<th>Reading rate $^{a}$</th>
<th>Comprehension accuracy $^{a}$</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Initial</td>
<td>Final</td>
</tr>
<tr>
<td>Low $\pi$ Academic Achievement ($N = 11$)</td>
<td>57.1</td>
<td>50.4</td>
<td>49.2</td>
</tr>
<tr>
<td>Medium $\pi$ Academic Achievement ($N = 11$)</td>
<td>56.5</td>
<td>50.9</td>
<td>54.6</td>
</tr>
<tr>
<td>High $\pi$ Academic Achievement ($N = 11$)</td>
<td>54.9</td>
<td>50.5</td>
<td>49.3</td>
</tr>
</tbody>
</table>

**Table X**

A COMPARISON OF DIFFERENCES ON READING SKILLS BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group comparisons</th>
<th>$\Delta\overline{X}$</th>
<th>$\Delta\overline{X}$</th>
<th>$\Delta\overline{X}$</th>
<th>$\chi^2$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low vs Medium</td>
<td>-0.28</td>
<td>-0.9</td>
<td>0.01</td>
<td>0.571 n.s.</td>
</tr>
<tr>
<td>Low vs High</td>
<td>-3.18</td>
<td>zero</td>
<td>3.9</td>
<td>0.414 n.s.</td>
</tr>
<tr>
<td>Medium vs High</td>
<td>-0.073</td>
<td>0.9</td>
<td>3.9</td>
<td>1.167 n.s.</td>
</tr>
</tbody>
</table>

Note: Level of need for academic achievement was inferred from Total $\pi$ Academic Achievement Gradient scores. Low level of need represents the persons who had lower $\pi$ Academic Achievement scores under Academic Achievement-oriented instructions than under Task-oriented instructions. The medium group neither gained nor lost in $\pi$ Academic Achievement score between the two instructional conditions. The high group obtained higher $\pi$ Academic Achievement scores on stories written under Academic Achievement-oriented instructions than on those written under Task-oriented instructions. Subjects were matched as closely as possible with respect to verbal ability ($O_{5}-P_{E}$) and an initial level of performance on the reading task. Nine (9) subjects of the total group of third-quarter freshmen ($N = 42$) were eliminated because appropriate matching could not be accomplished.

$^{a}$Performance measures with respect to reading skills were obtained at initial and final testing periods on the Robinson-Hall Canadian and Russian History Reading Tests. Reading rate refers to the mean number of words read per minute. Comprehension accuracy refers to the mean accuracy scores computed by dividing number of questions answered correctly by the number tried. Raw scores were converted to T-scores for this analysis.

$^{b}$Correlation between reading rate and comprehension accuracy scores.

$^{c}$Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
TABLE XI
A COMPARISON OF DIFFERENCES ON NOTE-TAKING SKILLS
BETWEEN MALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Working rate</th>
<th>Quality of notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O_S</td>
<td>Initial</td>
<td>Final</td>
</tr>
<tr>
<td>Low Academic Achievement</td>
<td>50.5</td>
<td>88.1</td>
<td>78.3</td>
</tr>
<tr>
<td>Medium Academic Achievement</td>
<td>55.4</td>
<td>89.5</td>
<td>74.1</td>
</tr>
<tr>
<td>High Academic Achievement</td>
<td>47.0</td>
<td>87.3</td>
<td>72.3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group comparisons</th>
<th>r</th>
<th>Working rate</th>
<th>Quality of notes</th>
<th>y² value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low vs Medium</td>
<td>.119</td>
<td>5.6</td>
<td>-1.9</td>
<td>0.404 m.e.</td>
</tr>
<tr>
<td>Low vs High</td>
<td>.157</td>
<td>5.2</td>
<td>1.7</td>
<td>0.578 m.e.</td>
</tr>
<tr>
<td>Medium vs High</td>
<td>.041</td>
<td>0.4</td>
<td>3.5</td>
<td>0.661 m.e.</td>
</tr>
</tbody>
</table>

Note: Level of need for academic achievement was inferred from Total n Academic Achievement scores obtained from stories written under Task-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (O_S_P.E) and on initial level of performance on the note-taking task. Eight (8) subjects of the total group of third-quarter freshmen (N = 32) were eliminated because appropriate matching could not be accomplished.

Collect measures with respect to note-taking skills were obtained at initial and final testing periods on typical textbook material. Working rate refers to the mean number of words read per minute while taking notes. Quality of notes refers to the mean rating of note quality computed on the basis of the rating procedures illustrated in Appendix D.

Correlation between working rate and rating of note quality.

Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Initial</th>
<th>Working rate Initial</th>
<th>Working rate Final</th>
<th>Quality of notes Initial</th>
<th>Quality of notes Final</th>
<th>$M_D$ Initial</th>
<th>$M_D$ Final</th>
<th>$M_D$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low A in Academic Achievement (N = 7)</td>
<td>45.1</td>
<td>80.3</td>
<td>82.6</td>
<td>2.3</td>
<td>14.3</td>
<td>18.1</td>
<td>3.8</td>
<td></td>
</tr>
<tr>
<td>Low B in Academic Achievement (N = 8)</td>
<td>47.1</td>
<td>90.8</td>
<td>89.4</td>
<td>2.4</td>
<td>13.3</td>
<td>16.4</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>Medium A in Academic Achievement (N = 7)</td>
<td>47.9</td>
<td>75.6</td>
<td>81.5</td>
<td>5.9</td>
<td>14.0</td>
<td>17.9</td>
<td>3.9</td>
<td></td>
</tr>
<tr>
<td>Medium B in Academic Achievement (N = 9)</td>
<td>50.3</td>
<td>74.3</td>
<td>71.2</td>
<td>3.1</td>
<td>14.7</td>
<td>18.0</td>
<td>3.3</td>
<td></td>
</tr>
<tr>
<td>High A in Academic Achievement (N = 8)</td>
<td>47.0</td>
<td>92.3</td>
<td>69.0</td>
<td>23.4</td>
<td>15.0</td>
<td>16.4</td>
<td>1.4</td>
<td></td>
</tr>
<tr>
<td>High B in Academic Achievement (N = 9)</td>
<td>48.2</td>
<td>74.8</td>
<td>59.8</td>
<td>15.0</td>
<td>15.2</td>
<td>16.8</td>
<td>1.6</td>
<td></td>
</tr>
</tbody>
</table>

Group comparisons:

<table>
<thead>
<tr>
<th>Working rate</th>
<th>Quality of notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low A vs Medium A</td>
<td>3.6</td>
</tr>
<tr>
<td>Low B vs High A</td>
<td>21.0</td>
</tr>
<tr>
<td>Medium B vs High B</td>
<td>11.9</td>
</tr>
</tbody>
</table>

Notes:

- Level of need for academic achievement was inferred from Total n Academic Achievement scores obtained from stories written under Academic Achievement-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (0.5 S, 3.5 E) and on initial level of performance on the note-taking task. Six (6) subjects of the total group of third-quarter freshmen (N = 32) were eliminated because appropriate matching could not be accomplished.

- Performance measures with respect to note-taking skills were obtained at initial and final testing periods on typical textbook material. Working rate refers to the mean number of words read per minute while taking notes. Quality of notes refers to the mean rating of note quality computed on the basis of the rating procedures illustrated in Appendix D.

- Correlation between working rate and rating of note quality.

- Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
### Table XIII

**A Comparison of Differences on Note-Taking Skills Between Male College Students of Different Levels of Motivation**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Working rate&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Quality of notes&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Initial</td>
<td>Final</td>
</tr>
<tr>
<td>Low&lt;sub&gt;A&lt;/sub&gt; Academic Achievement</td>
<td>(N = 9)</td>
<td>43.4</td>
<td>95.0</td>
</tr>
<tr>
<td>Low&lt;sub&gt;B&lt;/sub&gt; Academic Achievement</td>
<td>(N = 11)</td>
<td>43.8</td>
<td>89.3</td>
</tr>
<tr>
<td>Medium Academic Achievement</td>
<td>(N = 9)</td>
<td>42.1</td>
<td>95.7</td>
</tr>
<tr>
<td>High&lt;sub&gt;A&lt;/sub&gt; Academic Achievement</td>
<td>(N = 9)</td>
<td>47.9</td>
<td>94.8</td>
</tr>
<tr>
<td>High&lt;sub&gt;B&lt;/sub&gt; Academic Achievement</td>
<td>(N = 11)</td>
<td>48.1</td>
<td>89.0</td>
</tr>
</tbody>
</table>

**Group comparisons**

<table>
<thead>
<tr>
<th>Comparison</th>
<th>t&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Working rate</th>
<th>Quality of notes</th>
<th>(\nu^2) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low&lt;sub&gt;A&lt;/sub&gt; vs Medium</td>
<td>0.056</td>
<td>9.3</td>
<td>1.9</td>
<td>0.053 m.s.</td>
</tr>
<tr>
<td>Low&lt;sub&gt;B&lt;/sub&gt; vs High&lt;sub&gt;B&lt;/sub&gt;</td>
<td>0.001</td>
<td>3.9</td>
<td>0.4</td>
<td>0.041 m.s.</td>
</tr>
<tr>
<td>Medium vs High&lt;sub&gt;A&lt;/sub&gt;</td>
<td>0.021</td>
<td>16.9</td>
<td>1.2</td>
<td>0.046 m.s.</td>
</tr>
</tbody>
</table>

**Notes:**

- Level of need for academic achievement was inferred from Total Academic Achievement Approach Tendency scores obtained from stories written under Task-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (0, S, P, E) and on initial level of performance on the note-taking task. One (1) subject of the total group of third-quarter freshmen (N = 32) was eliminated because appropriate matching could not be accomplished.

- Performance measures with respect to note-taking skills were obtained at initial and final testing periods on typical textbook materials. Working rate refers to the mean number of words read per minute while taking notes. Quality of notes refers to the mean rating of note quality computed on the basis of the rating procedures illustrated in Appendix D.

- Correlation between working rate and rating of note quality.

- Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
### Table XIV

**A Comparison of Differences on Note-Taking Skills Between Male College Students of Different Levels of Motivation**

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Working Rate Mean Quality of Notes</th>
<th>Working Rate</th>
<th>Quality of Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low A &amp; Academic Achievement (N = 10)</td>
<td>Initial: 46.9 Final: 99.0</td>
<td>99.0</td>
<td>15.0</td>
</tr>
<tr>
<td>Low B &amp; Academic Achievement (N = 7)</td>
<td>Initial: 50.5 Final: 87.4</td>
<td>87.4</td>
<td>14.4</td>
</tr>
<tr>
<td>Medium A &amp; Academic Achievement (N = 10)</td>
<td>Initial: 49.5 Final: 99.0</td>
<td>99.0</td>
<td>14.5</td>
</tr>
<tr>
<td>Medium B &amp; Academic Achievement (N = 7)</td>
<td>Initial: 51.0 Final: 88.1</td>
<td>88.1</td>
<td>15.0</td>
</tr>
<tr>
<td>High &amp; Academic Achievement (N = 7)</td>
<td>Initial: 52.9 Final: 70.7</td>
<td>70.7</td>
<td>14.8</td>
</tr>
</tbody>
</table>

**Group Comparisons:**

<table>
<thead>
<tr>
<th>Group Comparison</th>
<th>r^b</th>
<th>Working Rate</th>
<th>Quality of Notes</th>
<th>( \chi^2 ) Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low A vs Medium A</td>
<td>-381</td>
<td>10.0</td>
<td>0.4</td>
<td>0.152 n.s.</td>
</tr>
<tr>
<td>Low B vs High</td>
<td>192</td>
<td>17.8</td>
<td>3.2</td>
<td>0.192 n.s.</td>
</tr>
<tr>
<td>Medium B vs High</td>
<td>223</td>
<td>12.7</td>
<td>2.7</td>
<td>0.941 n.s.</td>
</tr>
</tbody>
</table>

**Note:** Level of need for academic achievement was inferred from Total n Academic Achievement Approach Tendency scores obtained from stories written under Academic Achievement-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (0.5 P.E.R.) and an initial level of performance on the note-taking task. Five (5) subjects of the total group of third-quarter freshmen (N = 32) were eliminated because appropriate matching could not be accomplished.

**a**Performance measures with respect to note-taking skills were obtained at initial and final testing periods on typical textbook materials. Working rate refers to the mean number of words read per minute while taking notes. Quality of notes refers to the mean rating of note quality computed on the basis of the rating procedures illustrated in Appendix D.

**b**Correlation between working rate and rating of note quality.

**c**Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
TABLE XV
A COMPARISON OF DIFFERENCES ON NOTE-TAKING SKILLS
BETWEEN MALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Working rate</th>
<th>Quality of notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O.S.P.E.</td>
<td>Initial</td>
<td>Final</td>
</tr>
<tr>
<td>Low A Academic Achievement (N = 9)</td>
<td>44.0</td>
<td>113.1</td>
<td>87.3</td>
</tr>
<tr>
<td>Low B Academic Achievement (N = 8)</td>
<td>52.0</td>
<td>61.1</td>
<td>73.6</td>
</tr>
<tr>
<td>Medium A Academic Achievement (N = 9)</td>
<td>46.1</td>
<td>111.1</td>
<td>96.9</td>
</tr>
<tr>
<td>Medium B Academic Achievement (N = 7)</td>
<td>51.0</td>
<td>83.4</td>
<td>70.4</td>
</tr>
<tr>
<td>High A Academic Achievement (N = 8)</td>
<td>51.5</td>
<td>78.5</td>
<td>52.1</td>
</tr>
<tr>
<td>High B Academic Achievement (N = 7)</td>
<td>51.6</td>
<td>86.7</td>
<td>51.1</td>
</tr>
</tbody>
</table>

Group comparisons:

<table>
<thead>
<tr>
<th>Group comparisons</th>
<th>Difference between means</th>
<th>v^2 value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low A vs Medium A</td>
<td>0.041</td>
<td>0.168 n.s.</td>
</tr>
<tr>
<td>Low B vs High A</td>
<td>0.167</td>
<td>0.860 n.s.</td>
</tr>
<tr>
<td>Medium B vs High B</td>
<td>0.290</td>
<td>3.405^d</td>
</tr>
</tbody>
</table>

Notes:
1. Level of need for academic achievement was inferred from Total p Academic Achievement Gradient scores. Low level of need represents the persons who had lower p Academic Achievement scores under Academic Achievement-oriented instructions than under Task-oriented instructions. The medium group neither gained nor lost in p Academic Achievement score between the two instructional conditions. The high group obtained higher p Academic Achievement scores on stories written under Academic Achievement-oriented instructions than on those written under Task-oriented conditions. Subjects were matched as closely as possible with respect to verbal ability (O.S.P.E.) and an initial level of performance on the note-taking task. One (1) subject of the total group of third-quarter freshmen (N = 32) was eliminated because appropriate matching could not be accomplished.

2. Performance measures with respect to note-taking skills were obtained at initial and final testing periods on typical textbook material. Working rate refers to the mean number of words read per minute while taking notes. Quality of notes refers to the mean rating of note quality computed on the basis of the rating procedures illustrated in Appendix D.

3. Correlation between working rate and rating of note quality.

4. Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.

5. Statistically significant at beyond the 10% level of confidence.
TABLE XVI
A COMPARISON OF DIFFERENCES ON NOTE-TAKING SKILLS
BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Working rate*</th>
<th>Quality of notes*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C, S, E, P, E</td>
<td>Initial</td>
</tr>
<tr>
<td>Low_A in Academic Achievement (N = 10)</td>
<td>55.6</td>
<td>99.2</td>
</tr>
<tr>
<td>Low_B in Academic Achievement (N = 14)</td>
<td>56.9</td>
<td>107.9</td>
</tr>
<tr>
<td>Medium_A in Academic Achievement (N = 10)</td>
<td>50.4</td>
<td>96.3</td>
</tr>
<tr>
<td>Medium_B in Academic Achievement (N = 10)</td>
<td>54.7</td>
<td>94.3</td>
</tr>
<tr>
<td>High_A in Academic Achievement (N = 14)</td>
<td>53.9</td>
<td>107.7</td>
</tr>
<tr>
<td>High_B in Academic Achievement (N = 10)</td>
<td>56.6</td>
<td>95.7</td>
</tr>
</tbody>
</table>

Group comparisons:

<table>
<thead>
<tr>
<th></th>
<th>r</th>
<th>Working rate</th>
<th>Quality of notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low_A vs Medium_A</td>
<td>.602</td>
<td>4.4</td>
<td>.1</td>
</tr>
<tr>
<td>Low_B vs High_A</td>
<td>.471</td>
<td>6.5</td>
<td>.3</td>
</tr>
<tr>
<td>Medium_B vs High_B</td>
<td>.601</td>
<td>5.6</td>
<td>.3</td>
</tr>
</tbody>
</table>

Note: Level of need for academic achievement was inferred from Total n Academic Achievement scores obtained from stories written under Task-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (G.S.P.E.) and on initial level of performance on the note-taking task. Two (2) subjects of the total group of third-quarter freshmen (N = 42) were eliminated because appropriate matching could not be accomplished.

*Performance measures with respect to note-taking skills were obtained at initial and final testing periods on typical textbook material. Working rate refers to the mean number of words read per minute while taking notes. Quality of notes refers to the mean rating of note quality computed on the basis of the rating procedures illustrated in Appendix D.

Correlation between working rate and rating of note quality.

Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
TABLE XVII
A COMPARISON OF DIFFERENCES ON NOTE-TAKING SKILLS
BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Working rate(\times 100)</th>
<th>Quality of notes(\times 100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>O.S.P.I. Initial</td>
<td>O.S.P.I. Final</td>
<td>Working rate</td>
</tr>
<tr>
<td>Low_A Academic Achievement</td>
<td>58.1</td>
<td>102.6</td>
<td>92.9</td>
</tr>
<tr>
<td>Low_B Academic Achievement</td>
<td>58.9</td>
<td>98.1</td>
<td>91.5</td>
</tr>
<tr>
<td>Medium_A Academic Achievement</td>
<td>54.5</td>
<td>103.8</td>
<td>88.8</td>
</tr>
<tr>
<td>Medium_B Academic Achievement</td>
<td>48.9</td>
<td>92.7</td>
<td>95.2</td>
</tr>
<tr>
<td>High_A Academic Achievement</td>
<td>61.8</td>
<td>99.5</td>
<td>100.0</td>
</tr>
<tr>
<td>High_B Academic Achievement</td>
<td>50.6</td>
<td>91.7</td>
<td>91.4</td>
</tr>
</tbody>
</table>

- Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.

Notes:
- Level of need for academic achievement was inferred from Total O.S.P.I. scores obtained from stories written under Academic Achievement-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (O.S.P.I.) and on initial level of performance on the note-taking task. Four (4) subjects of the total group of third-quarter freshmen (N = 42) were eliminated because appropriate matching could not be accomplished.

Performance measures with respect to note-taking skills were obtained at initial and final testing periods on typical textbook material. Working rate refers to the mean number of words read per minute while taking notes. Quality of notes refers to the mean rating of note quality computed on the basis of the rating procedures illustrated in Appendix D.

Correlation between working rate and rating of note quality.

- Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
TABLE XVIII

A COMPARISON OF DIFFERENCES ON NOTE-TAKING SKILLS
BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Working rate</th>
<th>Quality of notes</th>
<th>Mean</th>
<th>Working rate</th>
<th>Quality of notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Initial</td>
<td>Final</td>
<td>Initial</td>
<td>Final</td>
</tr>
<tr>
<td>Low Academic Achievement</td>
<td>50.9</td>
<td>92.6</td>
<td>103.2</td>
<td>98.0</td>
<td>5.2</td>
</tr>
<tr>
<td>Low B Academic Achievement</td>
<td>53.7</td>
<td>109.9</td>
<td>103.9</td>
<td>109.9</td>
<td>6.4</td>
</tr>
<tr>
<td>Medium A Academic Achievement</td>
<td>50.4</td>
<td>99.1</td>
<td>109.0</td>
<td>93.1</td>
<td>6.9</td>
</tr>
<tr>
<td>Medium B Academic Achievement</td>
<td>49.8</td>
<td>91.5</td>
<td>97.4</td>
<td>91.5</td>
<td>5.9</td>
</tr>
<tr>
<td>High A Academic Achievement</td>
<td>54.4</td>
<td>97.5</td>
<td>104.3</td>
<td>97.5</td>
<td>7.3</td>
</tr>
<tr>
<td>High B Academic Achievement</td>
<td>52.8</td>
<td>87.0</td>
<td>94.5</td>
<td>87.0</td>
<td>7.3</td>
</tr>
</tbody>
</table>

Group comparisons:

- Low A vs Medium A: r = .485, v² = .0235
- Low B vs High A: r = .556, v² = .0727
- Medium B vs High B: r = .385, v² = .0263

Notes:
- Level of need for academic achievement was inferred from Total Academic Achievement Approach Tendency scores obtained from stories written under Task-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (0.5sPaE) and on initial level of performance on the note-taking task. Five (5) subjects of the total group of third-quarter freshmen (N = 42) were eliminated because appropriate matching could not be accomplished.

- Performance measures with respect to note-taking skills were obtained at initial and final testing periods on typical textbook material. Working rate refers to the mean number of words read per minute while taking notes. Quality of notes refers to the mean rating of note quality computed on the basis of the rating procedures illustrated in Appendix D.

- Correlation between working rate and rating of note quality.

- Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.

- Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
TABLE XIX

A COMPARISON OF DIFFERENCES ON NOTE-TAKING SKILLS
BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Working rate</th>
<th>Quality of notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(N = n) Initial</td>
<td>(n) Final (%)</td>
</tr>
<tr>
<td>LOW A in Academic Achievement ((N = 7))</td>
<td>54.0 115.4 109.0</td>
<td>6.4 17.3 19.9 2.6</td>
</tr>
<tr>
<td>LOW B in Academic Achievement ((N = 8))</td>
<td>62.9 113.3 106.4</td>
<td>6.9 16.4 20.5 4.1</td>
</tr>
<tr>
<td>MEDIUM A in Academic Achievement ((N = 7))</td>
<td>52.4 111.1 95.4</td>
<td>15.7 18.1 20.8 2.7</td>
</tr>
<tr>
<td>MEDIUM B in Academic Achievement ((N = 9))</td>
<td>55.1 102.4 96.2</td>
<td>6.2 16.3 20.4 4.1</td>
</tr>
<tr>
<td>HIGH A in Academic Achievement ((N = 8))</td>
<td>60.8 111.6 106.8</td>
<td>3.9 15.8 20.6 4.8</td>
</tr>
<tr>
<td>HIGH B in Academic Achievement ((N = 9))</td>
<td>55.7 102.9 106.8</td>
<td>3.9 15.6 20.2 4.6</td>
</tr>
</tbody>
</table>

Difference between means

<table>
<thead>
<tr>
<th>Group comparisons</th>
<th>Working rate</th>
<th>Quality of notes</th>
<th>(r^2) value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW A vs MEDIUM A</td>
<td>9.3</td>
<td>(= 0.1)</td>
<td>0.196 n.s.</td>
</tr>
<tr>
<td>LOW B vs HIGH A</td>
<td>(= 3.9)</td>
<td>(= 0.7)</td>
<td>0.070 n.s.</td>
</tr>
<tr>
<td>MEDIUM B vs HIGH B</td>
<td>(= 10.1)</td>
<td>(= 0.5)</td>
<td>0.374 n.s.</td>
</tr>
</tbody>
</table>

Notes: Level of need for academic achievement was inferred from Total Academic Achievement Approach Tendency scores obtained from stories written under Academic Achievement-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability \((0.5_S_90.0)\) and an initial level of performance on the note-taking task. Nine (9) subjects of the total group of third-quarter freshmen \((N = 42)\) were eliminated because appropriate matching could not be accomplished.

Performance measures with respect to note-taking skills were obtained at initial and final testing periods on typical textbook material. Working rate refers to the mean number of words read per minute while taking notes. Quality of notes refers to the mean rating of note quality computed on the basis of the rating procedures illustrated in Appendix D.

Correlation between working rate and rating of note quality.

Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
TABLE XX
A COMPARISON OF DIFFERENCES ON NOTE-TAKING SKILLS
BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean Quality of notes</th>
<th>Working rate</th>
<th>Quality of notes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial</td>
<td>Final</td>
<td>Initial</td>
</tr>
<tr>
<td>Low A Academic Achievement</td>
<td>56.4</td>
<td>93.2</td>
<td>82.9</td>
</tr>
<tr>
<td>Low B Academic Achievement</td>
<td>56.3</td>
<td>95.9</td>
<td>94.8</td>
</tr>
<tr>
<td>Medium A Academic Achievement</td>
<td>52.1</td>
<td>103.1</td>
<td>103.1</td>
</tr>
<tr>
<td>Medium B Academic Achievement</td>
<td>52.1</td>
<td>103.1</td>
<td>94.4</td>
</tr>
<tr>
<td>High A Academic Achievement</td>
<td>56.0</td>
<td>92.4</td>
<td>94.2</td>
</tr>
<tr>
<td>High B Academic Achievement</td>
<td>51.1</td>
<td>107.6</td>
<td>99.5</td>
</tr>
</tbody>
</table>

Group comparisons: $r^b$ Working rate Quality of notes $v^2$ value

| Low A vs Medium A | .462 | .032 | n.s.  |
| Low B vs High A   | .462 | .100 | n.s.  |
| Medium B vs High B| .501 | .693 | n.s.  |

Notes: Level of need for academic achievement was inferred from Total n Academic Achievement Gradient scores. Low level of need represents the persons who had lower n Academic Achievement scores under Academic Achievement-oriented instructions than under Task-oriented instructions. The medium group neither gained nor lost in n Academic Achievement score between the two instructional conditions. The high group obtained higher n Academic Achievement scores on stories written under Academic Achievement-oriented instructions than on those written under Task-oriented conditions. Subjects were matched as closely as possible with respect to verbal ability ($0.5_{.p,e}$) and on initial level of performance on the note-taking task. Four (4) subjects of the total group of third-quarter freshmen (N = 42) were eliminated because appropriate matching could not be accomplished.

Performance measures with respect to note-taking skills were obtained at initial and final testing periods on typical textbook material. Working rate refers to the mean number of words read per minute while taking notes. Quality of notes refers to the mean rating of note quality computed on the basis of the rating procedures illustrated in Appendix D.

Correlation between working rate and rating of note quality.

Differences between means for group comparisons are differences between means of the difference scores computed by subtracting initial from final measures of performance.
the resulting $v^2$ values are indicated.

Because appropriate matching of groups could not be accomplished with respect to the performance variables concerned, the comparisons were made between groups of subjects of various sizes. The size of the groups ranged from seven to fourteen subjects. Also, some subjects of the total group of males and females had to be eliminated from the analyses because of matching difficulties. These data are indicated in each of the following Tables.

Discussion. It can be seen from the data presented in Tables I through XX that only one of the observed differences between means of the difference scores on performance in learning reading and note-taking skills, between subjects who demonstrated different levels of the need for academic achievement, is significant at the 5% level of confidence. Thus, it is found that the test hypothesis can be rejected in only one instance. This difference is found with respect to improvement on reading rate and comprehension accuracy between groups of male subjects of low and medium level of motivation as inferred from Total $n$ Academic Achievement scores obtained from stories written under Academic Achievement-oriented instructional condition. The group of medium level of motivation improved to some extent on both reading rate and comprehension accuracy, whereas the group of low motivational level demonstrated poorer performance on these variables at the final testing period.\(^4\)

Two additional comparisons are significant at the 10% level of confidence. One, the observed differences between means of the

\(^4\)See Table II, pg. 61, for the presentation of these data.
difference scores on performance with respect to reading rate and comprehension accuracy are significant between groups of male subjects of low and high level of motivation as inferred from Total n Academic Achievement Approach Tendency scores obtained from stories written under Academic Achievement-oriented instructional condition. The group of high motivational level improved on these skills, while the group of low level of motivation showed poorer performance at the time of final testing. Two, the observed differences between means of the difference scores on performance with reference to working rate and note quality are significant between groups of male subjects of medium and high level of motivation as inferred from Total n Academic Achievement Gradient score. Both groups improved about equally with regard to note quality. The high motivational group demonstrated significantly poorer performance on working rate at the time of final testing than did the group of medium level of motivation.

An interpretation of these results presents several problems. In the next chapter some of the possible conclusions which can be drawn from these data will be discussed. In addition, some of the problems encountered in this study will be considered.

RESULTS OF RELATED CONCERN

In this section the results of differences on performance in learning to unscramble words, the effects of the determinants of n Academic

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5 See Table IV, pg. 63, for the presentation of these data.
6 See Table XV, pg. 74, for the presentation of these data.
Achievement score, the scoring consistency for the analysis of the picture interpretations test, and the reliability of ratings of the quality of notes will be presented.

**Differences on Performance in Learning to Unscramble Words**

The hypothesis with respect to these analyses of data is: There are no significant differences on performance in learning to unscramble words during the first and last three-minute work periods on a Scrambled Words task between groups of subjects who show high, medium, and low levels of need for academic achievement.

The purpose of including this task in the design of this study was outlined in Chapter III. It was hoped that these analyses might shed light on possible differences between immediate and longitudinal measures of performance in learning skills as they relate to the need for academic achievement. It was thought important to obtain an alternative and immediate measure of performance from which the effects of need for academic achievement on learning a simple verbal task might be determined.

**Method of analysis.** In order to determine the significance of differences on performance in learning to unscramble words between groups of different levels of academic achievement motivation, the t test of significance was employed. Since a situation existed in the design of this study in which the two means to be compared were based on matched cases, the t test of significance for the difference between
correlated means was used in these analyses.

To compute the significance of differences described above, the following procedures were followed. First, level of need for academic achievement was inferred from stories written under Academic Achievement-oriented instructions to the picture interpretations test. Subjects were classified into three groups, high, medium, and low motive level, on the basis of several different indices of Academic Achievement discussed in Chapter III. The breakdown into groups was made by dividing the distributions of Academic Achievement scores into thirds. Next, subjects were matched as closely as possible with respect to verbal ability and initial level of performance in unscrambling words. Because appropriate matching usually could not be accomplished, in all the group comparisons to be presented some subjects of the total group of third-quarter freshmen had to be eliminated. Finally, difference scores were calculated for each subject in the various groups by subtracting the performance scores obtained on the first from the last three-minute work period. The significance of differences was determined by computing t values of differences between means of the difference scores for the group comparisons in question.

If the values obtained were found to be significant at the 5\% level of confidence, then the test hypothesis can be rejected, and it might be concluded that the groups who demonstrated different levels of academic achievement motivation performed differently in learning to unscramble words.

7The descriptive statistics with respect to the measures on the scrambled words task for both male and female subjects are presented in Appendix A, Tables XXXIX and XL.
Results of analysis. Comparisons of differences on performance in learning to unscramble words at first and last three-minute work periods between subjects demonstrating different levels of need for academic achievement are shown in Tables XXI through XXVI. Presented in these Tables are the mean performance measures for the variables concerned, the mean differences between first and last three-minute work periods, the differences between means of the difference scores for the various group comparisons, and the resulting t values.

Discussion. It can be seen from the data presented in Tables XXI through XXVI that only one of the observed differences between means of the difference scores on performance in learning to unscramble words between subjects who demonstrated different levels of the need for academic achievement is significant at the 5% level of confidence. Thus, it is found that the test hypothesis can be rejected in only one instance. This difference is found with respect to groups of male subjects of low and high levels of motivation as inferred from Total n Academic Achievement scores obtained under Academic Achievement-oriented instructional condition. The group of low motivational level demonstrated evidence of a gain in output from the first to the last three-minute work period, whereas, the high n Academic Achievement group did not.8

Two other comparisons are significant at the 10% level of confidence. One, the difference between groups of male subjects of low and high levels of motivation as inferred from Total n Academic Achievement

8See Table XXI, pg. 85, for the presentation of these data.
TABLE XXI
A COMPARISON OF DIFFERENCES ON A SCRAMBLED WORDS TASK
BETWEEN MALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean O.S.P.E.</th>
<th>Mean number of words unscrambled</th>
<th>Difference between means</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>First</td>
<td>Last</td>
<td>M_D ^a</td>
</tr>
<tr>
<td>Low n Academic Achievement</td>
<td>50.2</td>
<td>14.7</td>
<td>16.4</td>
<td>1.7</td>
</tr>
<tr>
<td>Medium n Academic Achievement</td>
<td>53.4</td>
<td>14.0</td>
<td>12.9</td>
<td>-1.1</td>
</tr>
<tr>
<td>High n Academic Achievement</td>
<td>50.1</td>
<td>14.9</td>
<td>11.9</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Group comparisons

<table>
<thead>
<tr>
<th>Group comparison</th>
<th>Difference between means</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low vs Medium</td>
<td>2.8</td>
<td>1.506 n.s.</td>
</tr>
<tr>
<td>Low vs High</td>
<td>4.7</td>
<td>2.358 ^b</td>
</tr>
<tr>
<td>Medium vs High</td>
<td>1.9</td>
<td>0.965 n.s.</td>
</tr>
</tbody>
</table>

Note: Level of need for academic achievement was inferred from Total n Academic Achievement scores obtained from stories written under Academic Achievement-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (O.S.P.E) and on initial level of performance on the scrambled words task. Five (5) subjects of the total group of third-quarter freshmen (n = 32) were eliminated because appropriate matching could not be accomplished.

^aMeans of the difference scores were computed by subtracting measures of performance obtained on the first three-minute work period from those obtained on the last three-minute period.

^bDifferences between means for group comparisons are differences between means of the difference scores.

^cStatistically significant at beyond the 5% level of confidence.
TABLE XXII

A COMPARISON OF DIFFERENCES ON A SCRAMBLED WORDS TASK
BETWEEN MALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean O,S.F.I.</th>
<th>Mean number of words unscrambled</th>
<th>First</th>
<th>Last</th>
<th>M &amp; D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low n Academic Achievement</td>
<td>(N = 7)</td>
<td>47.7</td>
<td>13.9</td>
<td>15.3</td>
<td>1.9</td>
</tr>
<tr>
<td>Medium n Academic Achievement</td>
<td>(N = 7)</td>
<td>47.9</td>
<td>13.1</td>
<td>12.4</td>
<td>0.7</td>
</tr>
<tr>
<td>High n Academic Achievement</td>
<td>(N = 7)</td>
<td>48.6</td>
<td>13.6</td>
<td>12.2</td>
<td>1.4</td>
</tr>
</tbody>
</table>

Group comparisons: Difference between means: t value

<table>
<thead>
<tr>
<th></th>
<th>Difference between means</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low vs Medium</td>
<td>2.6</td>
<td>1.356 t.s.</td>
</tr>
<tr>
<td>Low vs High</td>
<td>3.3</td>
<td>1.782t</td>
</tr>
<tr>
<td>Medium vs High</td>
<td>-0.7</td>
<td>-0.317 t.s.</td>
</tr>
</tbody>
</table>

Note: Level of need for academic achievement was inferred from Total n Academic Achievement Approach Tendency scores obtained from stories written under Academic Achievement-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (O,S,F.I.) and on initial level of performance on the scrambled words task. Eleven (11) subjects of the total group of third-quarter freshmen (N = 32) were eliminated because appropriate matching could not be accomplished.

*Means of the difference scores were computed by subtracting measures of performance obtained on the first three-minute work period from those obtained on the last three-minute period.

bDifferences between means for group comparisons are differences between means of the difference scores.

cStatistically significant at beyond the 10% level of confidence.
TABLE XXIII
A COMPARISON OF DIFFERENCES ON A SCRAMBLED WORDS TASK
BETWEEN MALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean number of words unscrambled</th>
<th>Mean number of words scrambled</th>
<th>DIFFERENCE BETWEEN MEANS</th>
<th>t VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low n Academic Achievement</td>
<td>(N = 8) 52.5</td>
<td>13.3</td>
<td>12.7</td>
<td>0.6</td>
</tr>
<tr>
<td>Medium n Academic Achievement</td>
<td>(N = 8) 49.3</td>
<td>13.5</td>
<td>14.1</td>
<td>0.6</td>
</tr>
<tr>
<td>High n Academic Achievement</td>
<td>(N = 8) 51.5</td>
<td>13.0</td>
<td>12.0</td>
<td>1.0</td>
</tr>
</tbody>
</table>

GROUP COMPARISONS

<table>
<thead>
<tr>
<th>Group comparison</th>
<th>DIFFERENCE BETWEEN MEANS</th>
<th>t VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low vs Medium</td>
<td>- 1.2</td>
<td>0.535</td>
</tr>
<tr>
<td>Low vs High</td>
<td>- 0.4</td>
<td>0.197</td>
</tr>
<tr>
<td>Medium vs High</td>
<td>- 1.6</td>
<td>0.713</td>
</tr>
</tbody>
</table>

Note: Level of need for academic achievement was inferred from Total n Academic Achievement Gradient scores. Low level of need represents the persons who had lower n Academic Achievement scores under Academic Achievement-oriented instructions than under Task-oriented instructions. The medium group neither gained nor lost in n Academic Achievement score between the two instructional conditions. The high group obtained higher n Academic Achievement scores on stories written under Academic Achievement-oriented instructions than on those written under Task-oriented condition. Subjects were matched as closely as possible with respect to verbal ability (O.S.P.E.ES) and on initial level of performance on the scrambled words task. Eight (8) subjects of the total group of third-quarter freshman (N = 32) were eliminated because appropriate matching could not be accomplished.

Means of the difference scores were computed by subtracting measures of performance obtained on the first three-minute work period from those obtained on the last three-minute period.

Differences between means for group comparisons are differences between means of the difference scores.
TABLE XXIV

A COMPARISON OF DIFFERENCES ON A SCRAMBLED WORDS TASK
BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean number of words unscored</th>
<th>Mean number of words unscored</th>
<th>Mean number of words unscored</th>
<th>Mean number of words unscored</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>First</td>
<td>Last</td>
<td>First</td>
<td>Last</td>
</tr>
<tr>
<td>Low n Academic Achievement (N = 10)</td>
<td>55.1</td>
<td>17.2</td>
<td>14.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Medium n Academic Achievement (N = 10)</td>
<td>55.2</td>
<td>17.1</td>
<td>17.5</td>
<td>0.4</td>
</tr>
<tr>
<td>High n Academic Achievement (N = 10)</td>
<td>57.5</td>
<td>17.1</td>
<td>18.2</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Differences between means:

<table>
<thead>
<tr>
<th>Group comparison</th>
<th>Difference between means</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low vs Medium</td>
<td>- 3.0</td>
<td>1.316</td>
</tr>
<tr>
<td>Low vs High</td>
<td>- 3.7</td>
<td>1.779</td>
</tr>
<tr>
<td>Medium vs High</td>
<td>0.7</td>
<td>0.284</td>
</tr>
</tbody>
</table>

Note: Level of need for academic achievement was inferred from Total n Academic Achievement scores obtained from stories written under Academic Achievement-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (C.S.P.E.P.E) and on initial level of performance on the scrambled words task. Twelve (12) subjects of the total group of third-quarter freshmen (N = 42) were eliminated because appropriate matching could not be accomplished.

Means of the difference scores were computed by subtracting measures of performance obtained on the first three-minute work period from those obtained on the last three-minute period.

Differences between means for group comparisons are differences between means of the difference scores.

Statistically significant at beyond the 10% level of confidence.
A COMPARISON OF DIFFERENCES ON A SCRAMBLED WORDS TASK
BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean O.S.P.E.</th>
<th>Mean number of words unscored</th>
<th>Difference between means</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low in Academic Achievement</td>
<td>49.9</td>
<td>15.3</td>
<td>-0.7</td>
<td>0.352 n.s.</td>
</tr>
<tr>
<td>Medium in Academic Achievement</td>
<td>49.0</td>
<td>16.8</td>
<td>-1.5</td>
<td>0.609 n.s.</td>
</tr>
<tr>
<td>High in Academic Achievement</td>
<td>47.1</td>
<td>16.4</td>
<td>0.8</td>
<td>0.332 n.s.</td>
</tr>
</tbody>
</table>

Note: Level of mean for academic achievement was inferred from Total n Academic Achievement Approach Tendency scores obtained from stories written under Academic Achievement-oriented instructions. Subjects were classified into the three groups by breaking the distribution of scores into thirds. Subjects were matched as closely as possible with respect to verbal ability (O.S.P.E.) and on initial level of performance on the scrambled words task. Twelve (12) subjects of the total group of third-quarter freshmen (N = 42) were eliminated because appropriate matching could not be accomplished.

*Means of the difference scores were computed by subtracting measures of performance obtained on the first three-minute work period from those obtained on the last three-minute period.

* Differences between means for group comparisons are differences between means of the difference scores.
### TABLE XXVI

A COMPARISON OF DIFFERENCES ON A SCRAMBLED WORDS TASK
BETWEEN FEMALE COLLEGE STUDENTS OF DIFFERENT LEVELS OF MOTIVATION

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean 0&lt;sub&gt;S&lt;/sub&gt;P&lt;sub&gt;E&lt;/sub&gt;</th>
<th>Mean number of words unscrambled</th>
<th>Difference between means&lt;sup&gt;b&lt;/sup&gt;</th>
<th>t value</th>
<th>( \Delta ) &lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Academic Achievement</td>
<td>57.1</td>
<td>15.3</td>
<td>14.5</td>
<td>-0.3</td>
<td></td>
</tr>
<tr>
<td>Medium Academic Achievement</td>
<td>56.8</td>
<td>15.3</td>
<td>14.3</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>High Academic Achievement</td>
<td>57.1</td>
<td>15.6</td>
<td>16.7</td>
<td>1.1</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group comparisons</th>
<th>t value</th>
<th>( \Delta ) &lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low vs Medium</td>
<td>0.993 n.s.</td>
<td></td>
</tr>
<tr>
<td>Low vs High</td>
<td>0.839 n.s.</td>
<td></td>
</tr>
<tr>
<td>Medium vs High</td>
<td>0.037 n.s.</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

- Level of need for academic achievement was inferred from Total Academic Achievement Gradient scores. Low level of need represents the persons who had lower Academic Achievement scores under Academic Achievement-oriented instructions than under Task-oriented instructions. The medium group neither gained nor lost in Academic Achievement score between the two instructional conditions. The high group obtained higher Academic Achievement scores on stories written under Academic Achievement-oriented instructions than on those written under Task-oriented condition. Subjects were matched as closely as possible with respect to verbal ability (0<sub>S</sub>P<sub>E</sub>) and on initial level of performance on the scrambled words task. Nine (9) subjects of the total group of third-quarter freshmen (N = 42) were eliminated because appropriate matching could not be accomplished.

- \( \Delta \) means of the difference scores were computed by subtracting measures of performance obtained on the first three-minute work period from those obtained on the last three-minute period.

- Differences between means for group comparisons are differences between means of the difference scores.

- n.s. These letters signify that the comparison was not statistically significant.
Approach Tendency scores obtained under Academic Achievement-oriented condition is significant. Once again, the group of high motivational level performed less well on the final three-minute work period than did the group of low motivation for academic achievement. Two, the difference between groups of female subjects of low and high levels of motivation as inferred from Total n Academic Achievement score obtained under Academic Achievement-oriented condition is significant. However, in this instance the group of high motivation demonstrated a gain in output of words, whereas the group of low motivational level showed a loss from first to last three-minute work period.

Effects of the Determinants of n Academic Achievement Score

McClelland, et al (30), have pointed out three classes of cues which influence the frequency of imaginative responses from which the strength of motivation can be inferred. These are: (a) cues in the individual, (b) cues in the instructions prior to the administration of the picture interpretations test, and (c) cues in the pictures of the picture interpretations test. The analysis that follows was made in an attempt to determine the extent to which these cues contribute to the total variance in n Academic Achievement score.

Method of analysis. To determine the extent to which these variables contribute to the total variance in n Academic Achievement score,

9See Table XXII, pg. 86, for the presentation of these data.
10See Table XXIV, pg. 88, for the presentation of these data.
a 2 x 2 factorial design of analysis of variance was made. This procedure is described by Edwards (14). The variables concerned were as follows. One of the variables was method of test presentation and this was varied in two ways. The picture interpretations test was administered to subjects under Task-oriented and Academic Achievement-oriented instructions. Another variable was academic cue-value of the pictures. Three of the six pictures had many stimulus elements in them which could be classified as instrumental, academic-related objects, while the other three had few such stimulus elements in them. Lastly, cues in the individual, or the relatively autonomous thought processes that a student brings with him to the test situation, were factors to be considered. A person whose n Achievement score is largely a function of internal cues is thought by McClelland to be one who responds primarily to cues built up to an unusual strength within himself as a result of his past experiences in achievement situations (30). That is, the individual is thought to be one who is constantly thinking of achievement regardless of changes in the external situation.

Results of analysis. The summary of the analyses are given in Tables XXVII and XXVIII. The F ratios and their respective significance values are presented in these Tables. In Table XXIX are noted the n Academic Achievement score means obtained from stories written by both male and female subjects under the two conditions of motive arousal.

Discussion. In view of the tests made, the significant values of F for cues in the person and cue-value of the pictures provide support for an inference that cues in the individual and cue-value of the
## TABLE XXVII

**ANALYSIS OF VARIANCE OF EFFECTS OF THE DETERMINANTS ON ACADEMIC ACHIEVEMENT SCORE FOR MALE SUBJECTS**

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between groups</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method of test presentation</td>
<td>21.20</td>
<td>1</td>
<td>21.20</td>
<td>2.779 n.s.</td>
</tr>
<tr>
<td>Picture ease-value</td>
<td>684.50</td>
<td>1</td>
<td>684.50</td>
<td>89.712*</td>
</tr>
<tr>
<td>Interaction</td>
<td>6.05</td>
<td>1</td>
<td>6.05</td>
<td>0.793 n.s.</td>
</tr>
<tr>
<td><strong>Within groups</strong></td>
<td>1287.75</td>
<td>124</td>
<td>11.19</td>
<td></td>
</tr>
<tr>
<td>Between persons</td>
<td>678.00</td>
<td>31</td>
<td>21.87</td>
<td>2.866*</td>
</tr>
<tr>
<td>Residual</td>
<td>709.75</td>
<td>93</td>
<td>7.63</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2089.50</td>
<td>209</td>
<td>2099.50</td>
<td></td>
</tr>
</tbody>
</table>

*Statistically significant at beyond the 1% level of confidence.

b n.s. These letters signify that the comparison was not statistically significant.
### TABLE XXVIII
**ANALYSIS OF VARIANCE**
**OF EFFECTS OF THE DETERMINANTS ON ACADEMIC ACHIEVEMENT SCORE**
**FOR FEMALE SUBJECTS**

<table>
<thead>
<tr>
<th>Source of variation</th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Between groups</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method of test presentation</td>
<td>5.00</td>
<td>1</td>
<td>5.00</td>
<td>0.565 n.s. b</td>
</tr>
<tr>
<td>Picture cue-value</td>
<td>598.30</td>
<td>1</td>
<td>598.30</td>
<td>67.661a</td>
</tr>
<tr>
<td>Interactions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Method x picture cue-value</td>
<td>1.70</td>
<td>1</td>
<td>1.70</td>
<td>0.192 n.s.</td>
</tr>
<tr>
<td><strong>Within groups</strong></td>
<td>1772.00</td>
<td>164</td>
<td>10.80</td>
<td></td>
</tr>
<tr>
<td>Between persons</td>
<td>684.75</td>
<td>41</td>
<td>16.70</td>
<td>1.889a</td>
</tr>
<tr>
<td>Residual</td>
<td>1087.25</td>
<td>123</td>
<td>8.84</td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>2377.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*aStatistically significant at beyond the 1% level of confidence.

b*n.s.* These letters signify that the comparison was not statistically significant.
<table>
<thead>
<tr>
<th>Condition of motive arousal</th>
<th>Task-oriented</th>
<th>Academic Achievement-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Subjects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (N = 32)</td>
<td>2.9</td>
<td>8.0</td>
</tr>
<tr>
<td></td>
<td>10.9</td>
<td></td>
</tr>
<tr>
<td>Female (N = 42)</td>
<td>3.2</td>
<td>7.1</td>
</tr>
<tr>
<td></td>
<td>10.3</td>
<td></td>
</tr>
</tbody>
</table>
pictures contribute significantly to the total variance in Academic Achievement score under the conditions of this experiment. On the average, the Academic Achievement score is significantly greater to high academic cue pictures than to low cue pictures, but no significant differences in Academic Achievement score is evident between Task- and Academic Achievement-oriented instructional conditions. Also, there are no significant interaction effects between the variables (method of test presentation and picture cues) which cannot be accounted for in terms of the limits of chance. That is, there is no significant difference in response to the Task-oriented and Academic Achievement-oriented instructional conditions to the high and low academic-cue pictures.

Scoring Consistency on the Picture Interpretations Test

Since the content analysis procedure for scoring protocols on the picture interpretations test used in this experiment involved subjective judgments and the matching of story content against category definitions, the reliability of scoring the protocols became an important factor in the investigation. Two estimates of scoring consistency were established. The inter-scorer agreement, and the score-rescore consistency of the experimenter were determined.

Method of analysis. The procedures adopted by the experimenter to determine the consistency of the judges in scoring protocols on the picture interpretations test were as follows. First, the agreement in scoring protocols for both Step I and Step II of the scoring manual between the experimenter and one other judge was established. In order
to determine the relationship between judges in scoring story content for Step I of the content analysis procedures, a sample of one hundred of the 888 protocols (74 subjects, 12 stories per subject) was chosen, at random, to be scored by the experimenter and the other judge. As discussed in Chapter III, in Step I the scorer was to decide whether or not the story contained any reference to an Academic Achievement goal which would justify his scoring the sub-categories (Need, Instrumental Activity, and so on) as academic achievement-related. Here, the stories were scored for three imagery categories: (a) Academic Achievement Imagery, (b) Doubtful Academic Achievement Imagery, and (c) Unrelated Imagery. Per cent agreement between judges with respect to categorizing story content was computed. Likewise, to determine the relationship between judges in scoring story content for Step II of the content analysis procedures, a sample of seventy-five of the 296 protocols which had been scored for Academic Achievement Imagery content was chosen, at random, to be scored by the experimenter and the other judge. As noted in Chapter III, in Step II the stories scored for Academic Achievement Imagery were scored further for fourteen Academic Achievement-related sub-categories. Again, per cent agreement between judges with respect to categorizing story content was computed.

Second, as further evidence of scoring consistency, the score-rescore consistency of the experimenter in scoring story content for both Step I and Step II of the content analysis procedures was determined.

The procedure adopted by the experimenter to determine his score-rescore consistency was the same as that just discussed in the previous
paragraph. To establish his scoring consistency for Step I of the scoring manual, the random sample of one hundred protocols mentioned before was rescored approximately two weeks after the time of initial scoring. Per cent agreement between initial and subsequent scorings with respect to categorizing story content was then computed. Similarly, to establish the experimenter's scoring consistency for Step II of the analysis procedures, the sample of seventy-five records discussed above was rescored. Once again, per cent agreement between initial and subsequent scorings was calculated.

Results of analysis. The agreement between the experimenter and one other judge in scoring protocols on the picture interpretations test for Step I (involving three imagery categories) and Step II (involving fourteen imagery categories) of the content analysis procedures was 83.0% and 85.4%, respectively. The agreement in scoring protocols for Step I and Step II of the content analysis procedures between initial and subsequent scorings by the experimenter was 89.0% and 86.7%, respectively.

Discussion. The results just presented indicate that there is a high degree of consistency between judges, and also on the part of the investigator himself on scoring the protocols obtained from subjects on the picture interpretations test used in this study.

Reliability of Rating Note Quality

As noted in Chapter III, the notes which students took over the reading selections from a typical college political science textbook
were rated as to general appearance, use of an outline scheme, and meaningfulness. This method of rating was used throughout the training period. Later, however, the experimenter found it was impossible to establish reliability for this procedure. The chief difficulty with this system was that the items, which were first thought to be descriptive of note quality with respect to the note-taking skills taught in Psychology 111, were ambiguous in nature. The involved wording of the verbal descriptions defining the numerical categories caused disagreement in judgments among the raters, and these descriptions did not carry uniform significance for the raters responding to them. Because of these difficulties the experimenter devised a more objective technique, and ratings based on this method were used in the analyses of data.

The procedures adopted by the experimenter to develop this more objective measure of the quality of notes were as follows. First, a sample of seventy-six statements about note quality were culled from a number of sources (11, 44, 56). These items were typed on 3 x 5 cards, one statement per card. Second, each item was judged by fifteen persons as to its proper position on a note quality scale. One extreme of the scale represented those statements the judges believed to be "most" characteristic of "good" quality notes, while the other extreme referred to those "least" characteristic of "good" quality notes, as taught in Psychology 111. The scale was divided into six classes, and the judges

11 These individuals had knowledge of the teaching procedures and goals of Psychology 111. This group was comprised of: (a) graduate students who had counseled students enrolled in Psychology 111; (b) former instructors of the course; and (c) instructors who had charge of the course at the time of the experiment.
were forced to sort the statements into the class positions on a quasi-normal frequency basis. The class positions were assigned numerical values from one to six; consequently, it was possible to score each item for each sorter. Third, only those statements for which there was a high degree of agreement among the judges as to class position were selected. Those statements which were assigned to almost all positions were eliminated. Next, a scale score was calculated for the remaining items. This score was computed as the median class position given by the group of judges for that item. Finally, the rating scale was comprised of twenty-four items so chosen to have values that spread along the various parts of the quality scale. On the basis of a content factoring procedure, it seemed possible to group these statements as follows: (1) form of notes, which included use of an outline scheme and use of space; (2) organization of notes, that is, relationship between headings, sub-headings, and detail; and (3) phrasing of notes, which included use of detail and extent of wordiness. Notes were then rated independently for each factor to avoid any chance of systematic bias in scoring.

Since this rating procedure involved subjective judgments, the reliability of rating notes for quality characteristics became another important factor in the investigation. Two estimates of rating consistency were established. The inter-rater reliability and the score-rescore consistency of the raters were determined.

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A copy of this rating scale is reproduced in Appendix D.
Method of analysis. The procedures adopted by the experimenter to determine the consistency of the raters were as follows. First, the agreement between the experimenter and one other rater was established. In order to determine the relationship between raters in scoring notes for quality characteristics, one half of the 222 sets of notes (74 subjects, 3 sets of notes per subject) previously scored by both raters, were chosen to be re-scored by the experimenter and the other rater. The Pearson Product Moment correlation between the scorings of the two raters was computed.

Second, the score-rescore consistency of each rater was determined. All notes taken to reading selection III were scored by one person, while those obtained over article IV were scored by the experimenter. One half of each of the 74 sets of notes (74 subjects, 1 set of notes per subject) were chosen to be re-scored by the respective rater. Here, the Pearson Product Moment correlation between the scores computed at the time of initial rating and those computed at the time of subsequent rating was calculated.

Results of analysis. The relationship between the experimenter and one other rater in scoring notes for quality characteristics was found to be .91 (N = 111). The score-rescore reliability coefficient for the experimenter in rerating notes on reading selection IV was .93 (N = 37), while the coefficient for the other rater in rerating notes on reading selection III was .95 (N = 37).

Discussion. The results just presented indicate that there is a high degree of consistency between scorers and also on the part of the
raters themselves on scoring notes for quality characteristics.

**RESUME OF THE FINDINGS**

The findings of the experiment are briefly listed below:

1. In only one comparison between groups of subjects who differed with respect to level of need for academic achievement, as inferred from fantasy productions to a picture interpretations test, is there found a significant difference on performance in learning reading and note-taking skills. This difference is found with respect to improvement on reading rate and comprehension accuracy between groups of male subjects of low and medium levels of motivation as inferred from Total Academic Achievement scores obtained from stories written under the Academic Achievement-oriented instructional condition. The group of medium level of motivation improved to some extent on both reading rate and comprehension accuracy, whereas, the group of low motivational level demonstrated poorer performance at the final testing period than they had attained at the beginning of training.

2. In only one comparison between groups of subjects who differed with respect to level of need for academic achievement, as inferred from fantasy productions to a picture interpretations test, is there found a significant difference on performance in learning to unscramble words on a Scrambled Words task. This difference is found between groups of male subjects of low and high levels of motivation as inferred from Total Academic Achievement scores obtained from stories written under the Academic Achievement-oriented instructional condition. The group of low level of motivation demonstrated a gain in output of unscrambled words.
from the first to the last three-minute work period, whereas, the high Academic Achievement group did not. In fact, the group of high motivational level performed less well on the last three-minute period than they did on the first three-minute work period.

3. On the average, the Academic Achievement score, as inferred from the thematic records, is significantly greater to high than to low academic cue pictures. There is found no significant differences in Academic Achievement score between Task- and Academic Achievement-oriented instructional conditions.

4. The scoring consistency of the judges with respect to the content analysis on the picture interpretations test is quite reliable.

5. There is found a high degree of consistency between scorers and also on the part of the raters themselves on scoring notes for quality characteristics.

Interpretation of the results of this investigation present many problems. The possible conclusions which can be drawn will be discussed in the next chapter.
CHAPTER V

CONCLUSIONS, SUGGESTIONS FOR FURTHER RESEARCH
AND SUMMARY

The results of this study require cautious interpretation. In the previous chapter it was noted that subjects who differed with respect to level of need for academic achievement, as inferred from fantasy productions to a picture interpretations test, in general, did not show significantly different performance in learning reading and note-taking skills, nor did they show significantly different performance in learning to unscramble words on a scrambled words task. The following discussion is offered as an attempt to clarify the results obtained.

The findings of this investigation indicate that the particular technique employed to measure the strength of the need for academic achievement was probably not a measure of this need. In short, the question of whether subjects who score high on the measure of this need, a measure inferred on the basis of a content analysis of fantasy productions to a picture interpretations test, behave as if they are highly motivated for academic achievement would be, in general, answered in the negative. It is likely that the pictures which comprise the test may elicit a good many stereotyped responses about academic situations, responses which do not necessarily reflect need for academic achievement.

The above conclusion is supported by the finding noted in the previous chapter that the only determinant of a Academic Achievement score which seemed to be operating in this experiment was high academic
cues-value of the pictures. This would lead one to suspect that the picture interpretations test was not measuring the need for academic achievement. Rather, it seems probable that the test is simply a measure of certain culturally determined and somewhat stereotyped response tendencies. It is thought that the "classroom" atmosphere of the testing situation, the fact that the experiment was conducted in a how-to-study setting, plus the elements in the pictures themselves which suggest study activity to a greater or lesser extent, may have all functioned to elicit these response tendencies. Therefore, it seems probable that situational and habit determinants of behavior may have been the important factors operating under the testing conditions employed here.

As indicated in Chapter II, McClelland and his associates found it was possible to infer achievement motivation from the content of imaginative thought, and that differences in strength of achievement motivation, as inferred from fantasy productions, was related to performance and learning. This was not the case in the present study. Consequently, the assumption that individual differences in frequency of achievement-related imaginative responses reflect the strength of an individual's need to achieve cannot be accepted on the basis of the findings in this investigation.

In interpreting these results, there are some characteristics of the research design which should be discussed. These are with respect to the peculiarities of the sample used and the type of training the students received.
Sample characteristics. McClelland stated in the review of the research on achievement motivation (30) that testing conditions which employ achievement-arousal instructions may arouse sufficient anxiety in some individuals to cause an inhibition of achievement motivation imagery. A possibility with reference to the sample used in the present study may be that the anxiety level of these subjects was so intense that all performance was depressed or inhibited to some extent. If so, this may account for the fact that no significant differences in academic achievement score were found between Task- and Academic Achievement-oriented instructional conditions.

Previous investigations of the role of anxiety in testing situations indicate that anxiety-evoking stimulation can have a different effect (interfering or supporting) on different individuals (26, 53). Sarason (50) found that high motivational instructions, instructions which indicated to the subjects that the task was a measure of their intelligence, were detrimental to the performance of a high anxiety group, but facilitating for the low and middle anxiety groups. In another experiment, Sarason, Mandler, and Craighill (51) pointed out that when anxiety has been learned as a response to situations involving intellectual achievement (e.g., test situations) two types of responses tend to be evoked: (a) responses which are not task-relevant, and (b) those which are task-relevant. Responses which are not task-relevant are described as attempts at leaving the situation, anticipations of failure, and self-deprecatory statements on the part of the testee. This type of response resembles closely the avoidant imagery responses scored as academic achievement-related imagery in this study. Responses
which are task-relevant are thought to be those which tend to reduce anxiety by leading to completion of the task. Task-relevant responses, then, are similar to the approach features of the academic achievement-related imagery scored in the present experiment.

When an examination is made of the frequencies of the types of imagery elicited from the subjects in the present study, it is found that the frequency of avoidant-related imagery is greater than the approach-related responses in almost all instances. This leads one to suspect that the subjects may have been quite anxious, and it seems likely that the high motivational instructions of the Academic Achievement-oriented condition of test administration may have been detrimental to their performance. Hence, it could be concluded that the anxious reactions of these subjects, who were undoubtedly prone to such tendencies in a testing situation, since they were of low ability level and had been experiencing failure in college for some months, actually interfered with their performance both on the measure of need for academic achievement and the criterion measures involved.

The above interpretation is largely supposition, but even so, it seems reasonable to raise the question of what might be expected had a more representative sample of college freshmen been employed. It appears likely that one could expect differences on both the Academic Achievement measure and on the criterion performance measures involved. Thus, before any definite conclusions can be stated, further research seems warranted.

These data are presented in Appendix A, Tables XXX and XXXI.
Training difficulties. An important problem in a study of this kind is the type and quality of study skill training to which students are exposed. As indicated in Chapter III, the training the students received was conducted by the instructors in charge of the classes and not by the investigator. There were six instructors involved in the training of the subjects used in this experiment. Although the experimenter attempted to maintain standard procedures among the instructors, this was not entirely successful. On the basis of subjective evaluation, it appeared that some instructors were more ego-involved in the experiment than others. Thus, to some extent the training on note-taking skills varied with a particular instructor's concern over the value of the project, and too, with the time which he felt he could devote to it. What specific effects these variations had on the results of the study could not be determined by the investigator.

Another problem is one related to the question of whether definite gains in study performance can be expected within brief training periods such as those employed here. There have been two studies, one by DeLong (13) and another by Coleman (11) which indicate that the lack of significant improvement in study skills in a course such as Psychology 111 may reflect the fact that how-to-study training cannot be expected to induce definite gains without a considerable amount of practice, more than is usually given in a course that extends over an interval of ten weeks.

Within the training period of five sessions in this investigation, only limited improvement on note-taking skills was evident. To illustrate the fact that there definitely was room for more improvement on the part of the subjects in this study, an analysis was made of the mean
performances at the first and last study skill training trials for the
groups concerned. The data of this analysis are summarized in Appendix
A, Tables XXXVI and XXXVII. It is found that the mean performance of
the subjects on note-taking skill from trial one to trial five indicates
only limited improvement, and that final performance was much below that
which could be considered optimal for these skills. The optimal working
rate for the reading selections employed was thought to be approximately
140 words per minute. Only five of the total group of students (N = 74)
reached this level of performance at the last training trial. The mean
performance for the group was 86.0; 74.6 for the males, and 94.5 for the
females. The optimal rating on the rating scale devised to evaluate
outlining proficiency was 27.3. On the last training period only ten of
the students approached this rating of quality. The mean performance on
note-quality for the group was 19.1; 18.0 for the males, and 19.9 for
the females. From these data, it is concluded that the findings seemed
to conform with the results obtained by DeLong (13) and Coleman (11)
mentioned previously. With respect to this matter, then, the question
might well be raised as to whether it is practical to expect students in
a how-to-study program to show definite gains in study performance over
such a short training period. One might suggest, therefore, that addi­
tional training and practice would be needed before significant improve­
ment would become evident on such criterion measures.

SUGGESTIONS FOR FURTHER RESEARCH

The results of this experiment point out the need for further
studies either in terms of clarification of some of the results here
reported or in terms of closely allied questions. The list of problems suggested is by no means exhaustive. The more important issues at the present time seem to be as follows:

1. First, it is recommended that another study similar to this be conducted using a more representative sample of college students. Because of the peculiarities of the sample employed in this experiment, it would seem important to know about the possible differences with respect to Academic Achievement score and study-skill performance between the present sample and a more representative sample of college freshmen.

   It is suggested that in such a study it would be advisable to incorporate additional and more closely supervised training and practice. This could be accomplished by conducting special training sessions more directly related to the study skills in question. In this manner, the experimenter could control the situation more effectively. He would also be in a position to give individual attention to the subjects by offering criticisms and suggestions regarding the skills involved.

2. Second, a further study should be designed to explore the relationship between Academic Achievement score and learning or efficiency on an academic task less complex than the higher-level study skills employed in this investigation. A less complex task would eliminate the practical limitations of lengthy training and practice periods.

3. Third, it is suggested that a study be conducted to assess the effects of academic achievement arousal instructions on learning between groups whose Academic Achievement scores reflect primarily approach or avoidant response tendencies. One would predict that when the motivational instructions for a given task contain elements which specifically
arouse test or academic achievement anxiety, the increase in anxiety
drive should lead to poorer performance in individuals who have task-
irrelevant anxiety responses in their response repertory. For such
persons without such response tendencies, these instructional stimuli
should tend to raise their general drive level and result in improved
performance. If this relationship could be established, the evidence
would support the validity of this technique as a measure of academic
achievement motivation.

4. Fourth, it is thought that a descriptive study is warranted to
determine the relationship between n Academic Achievement score and
various other personality characteristics. A comparison of the measure
of n Academic Achievement to those of college grades, maturity of in-
terests, feelings of responsibility and self-confidence, concern for
others, interest in academic matters, and other questionnaire measures
of achievement motivation seems to be needed.

5. Fifth, the entire question of the validity of the picture in-
terpretations technique should be examined. It has not been demon-
strated that one can make any broad generalizations about the relation-
ship between fantasy productions and overt behavior. When one is at-
ttemping to make predictions from fantasy materials, such as elicited
to a picture interpretations test, he is faced with these questions.
When a person relates a story in which the central figure overcomes
obstacles and succeeds in obtaining high academic achievement goals,
does this mean that the person telling the story will show great per-
sistence and endurance in overcoming such obstacles? Is he describing
his own behavior, or is he describing simply what he would like to have
occur? In other words, when the task is structured as simply one of
telling a story about the pictures involved, does one tend to get re­
sponses that reveal primarily: (a) how the individual behaves; (b)
what his expectations for gratification are; (c) what goals he has and
how he values them; or (d) all of these in some separate or mixed fash­
ion? These seem to be the main problems for future research.

**SUMMARY**

This study was designed to explore the possibility of measuring the
need for academic achievement, and to assess the role of this motive on
performance in learning certain study skills. The question which guided
this research was: Will students who differ with respect to academic
achievement motivation, as inferred from fantasy productions to a pic­
ture interpretations test, show significantly different performance in
learning reading and note-taking skills?

A review was made of the various methods and instruments which have
been used to measure human motivation. From this resume it was con­
cluded that further research was needed to explore the possibilities of
measuring more specific motives, and also, that more attention needed
to be given to the development of a systematic method for measuring the
need for academic achievement. Since the experimental design of the
present study was intended to meet these needs, the rationale of the
picture interpretations technique as devised by McClelland, et al (30)
to measure achievement motivation was reviewed. Other investigations
which were pertinent to the present experiment were also discussed. A
search of the literature revealed studies aimed at showing that
achievement motivation can be inferred from the content of imaginative thought, and that differences in the strength of this motive are related to performance and learning.

The experimental design used most extensively by McClelland and his associates was the prototype for the present study; however, two modifications were introduced. One, whereas the major part of the previous research had been concerned with devising a systematic method of measuring the need for achievement, the present research represented an attempt to measure a sub-type of this motive, the need for academic achievement. Two, in much of the previous research the effect of achievement motivation on immediate performance in simple learning tasks was studied. In this investigation, the aim was to determine the effect of academic achievement motivation on the delayed performance of students in learning complex study skills, tasks more directly related to the motive in question.

The setting of the experiment was a how-to-study course taught in the Department of Psychology at The Ohio State University. The study was conducted over a period of ten weeks as part of the laboratory work of this course, Spring quarter, 1955. The subjects employed were third-quarter freshmen students who were enrolled in Psychology 111 at the time.

The experiment was performed under two conditions of motive arousal designed to vary the degree to which good performance on the tasks would be interpreted by subjects as evidence of their competence in a college setting. First, the students worked under a Task-oriented set of instructions, and second, they were tested under an Academic Achievement-
oriented instructional condition. The strength of a subject's need for
academic achievement was inferred from his fantasy productions to a pic­
ture interpretations test. The test was composed of pictures drawn to
suggest the possibility of study activity to a greater or lesser extent.
Subjects were classified into three groups representing different moti­
vational levels, high, medium, and low, on the basis of Academic
Achievement scores derived from the analysis of their stories on this
test.

To assess the differences between these groups on performance in
learning a verbal task at the time of motive-arousal, a Scrambled Words
Test was administered to them immediately after they had responded to
the picture interpretations test. To assess the differences between
these groups on performance in learning reading skills, measures were
obtained from each student at the beginning and at the end of the quar­
ter on both reading rate and comprehension accuracy. To assess the
differences between these groups on performance in learning note-taking
skills, measures were obtained from them on: (a) working rate while
reading and taking notes, and (b) quality of notes. These measures were
obtained over a series of five training sessions which were held at two-
week intervals throughout the quarter.

The significance of differences on performance in learning the
skills just discussed between subjects who demonstrated high, medium,
and low level of the need for academic achievement was determined.
These analyses were made on the groups after they had been matched on:
(a) initial level of performance on the particular skill in question;
(b) verbal ability; and (c) length of time exposed to college experiences.
The latter variable was controlled by using subjects all of whom were third-quarter freshmen students at The Ohio State University. Level of verbal ability was based on their performance on the Ohio State University Psychological Examination, a scholastic ability test. The data were then analyzed separately for each sex.

A \( t \) test of significance between correlated means was employed to determine the significance of differences on performance in learning to unscramble words on the Scrambled Words task between groups of different levels of academic achievement motivation.

A \( \chi^2 \) test of significance, as described by Hald (18), was used to determine the significance of differences on performance in learning reading and note-taking skills between groups who demonstrated different levels of the need for academic achievement.

An analysis of the effects of the determinants of \( n \) Academic Achievement score was made. The score-rescore consistency and the inter-scorer agreement of those who judged the protocols of the picture interpretations test were established. Also, the reliability of the raters who scored the quality of notes was determined.

It was found that in only one comparison on performance in learning reading and note-taking skills between groups of subjects who differed with respect to level of need for academic achievement did the observed differences reach the 5% level of significance. This finding was in relation to improvement in reading rate and comprehension accuracy between groups of male subjects of low and medium levels of motivation as inferred from Total \( n \) Academic Achievement scores obtained from stories written under the Academic Achievement-oriented instructional condition.
Likewise, in only one of the comparisons on performance in learning to unscramble words on a scrambled words task between groups of different motivational level did the observed differences reach the 5% level of significance. This difference was found between groups of male subjects of low and high levels of motivation as inferred from Total Academic Achievement scores obtained from stories written under the Academic Achievement-oriented instructional condition.

Among the minor findings it was noted that: (a) on the average, the Academic Achievement score was significantly greater to high than to low academic cue pictures, but no significant differences in Academic Achievement scores were evident between Task- and Academic Achievement-oriented instructional conditions; (b) the scoring consistency of the scorers for the picture interpretations test was quite reliable; and (c) there was a high degree of consistency between scorers and also on the part of the raters themselves on scoring notes for quality.
BIBLIOGRAPHY


49. Sargent, H. An experimental application of projective principles to a paper and pencil personality test. Psychol. Monogr., 1944, 57. No. 5.


APPENDIX A

PRESENTATION OF DESCRIPTIVE STATISTICS
ON BASIC RAW DATA
TABLE XXX

FREQUENCIES FOR TYPES OF ACADEMIC ACHIEVEMENT IMAGERY FROM STORIES WRITTEN BY MALE SUBJECTS UNDER TWO CONDITIONS OF MOTIVE AROUSAL TO PICTURES OF LOW AND HIGH ACADEMIC CUE-VALUE

<table>
<thead>
<tr>
<th>Imagery category</th>
<th>Task-oriented</th>
<th>Academic Achievement-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Academic achievement imagery</td>
<td>18</td>
<td>52</td>
</tr>
<tr>
<td>Doubtful imagery</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>Unrelated imagery</td>
<td>59</td>
<td>22</td>
</tr>
</tbody>
</table>

Stated needs:
- for academic accomplishment
- for help in circumventing adverse academic achievement evaluation

<table>
<thead>
<tr>
<th>Instrumental activity</th>
<th>Task-oriented</th>
<th>Academic Achievement-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>leading to academic accomplishment</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>leading away from academic accomplishment</td>
<td>13</td>
<td>19</td>
</tr>
</tbody>
</table>

Anticipatory academic goal states:
- anticipation of academic success
- anticipation of academic failure

<table>
<thead>
<tr>
<th>Affective states</th>
<th>Task-oriented</th>
<th>Academic Achievement-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>positive emotional concomitants of academic accomplishment</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>negative emotional concomitants of academic failure</td>
<td>4</td>
<td>9</td>
</tr>
</tbody>
</table>

Press:
- nurturant press
- hostile press
- personal obstacles
- environmental obstacles

<table>
<thead>
<tr>
<th>Academic achievement themes</th>
<th>Task-oriented</th>
<th>Academic Achievement-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>hope of academic success theme</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>fear of academic failure theme</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

Note: The total number of stories written under each condition of motive arousal is 198 (32 subjects, 6 stories each).
TABLE XXXI

FREQUENCIES FOR TYPES OF ACADEMIC ACHIEVEMENT IMAGERY FROM STORIES WRITTEN BY FEMALE SUBJECTS UNDER TWO CONDITIONS OF MOTIVE AROUSAL TO PICTURES OF LOW AND HIGH ACADEMIC CUE-VALUE

<table>
<thead>
<tr>
<th>Condition of motive arousal</th>
<th>Task-oriented</th>
<th>Achievement-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Imagery category</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic achievement imagery</td>
<td>24</td>
<td>55</td>
</tr>
<tr>
<td>Doubtful imagery</td>
<td>34</td>
<td>50</td>
</tr>
<tr>
<td>Unrelated imagery</td>
<td>68</td>
<td>21</td>
</tr>
</tbody>
</table>

Stated need:
- for academic accomplishment
  - 2
  - 3
  - 1
  - 2
- for help in circumventing adverse academic achievement evaluation
  - 4
  - 10
  - 4
  - 5

Instrumental activity:
- leading to academic accomplishment
  - 2
  - 6
  - 5
  - 10
- leading away from academic accomplishment
  - 13
  - 23
  - 11
  - 19

Anticipatory academic goal states:
- anticipation of academic success
  - 4
  - 6
  - 4
  - 13
- anticipation of academic failure
  - 4
  - 12
  - 3
  - 17

Affective states:
- positive emotional concomitants of academic accomplishment
  - 2
  - 7
  - 2
  - 5
- negative emotional concomitants of academic failure
  - 6
  - 11
  - 3
  - 14

Press:
- nurturant press
  - 7
  - 24
  - 16
  - 22
- hostile press
  - 0
  - 2
  - 0
  - 1
- personal obstacles
  - 6
  - 27
  - 10
  - 30
- environmental obstacles
  - 1
  - 0
  - 1
  - 0

Academic achievement themes:
- hope of academic success theme
  - 1
  - 4
  - 1
  - 5
- fear of academic failure theme
  - 0
  - 4
  - 0
  - 3

Note: The total number of stories written under each condition of motive arousal is 252 (42 subjects, 6 stories each).
<table>
<thead>
<tr>
<th>Statistic</th>
<th>Total score</th>
<th>Task-oriented</th>
<th>Academic Achievement-oriented</th>
<th>Total score</th>
<th>Task-oriented</th>
<th>Academic Achievement-oriented</th>
<th>Total Gradient score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>0 to 19</td>
<td>0 to 20</td>
<td>-4 to 11</td>
<td>0 to 14</td>
<td>0 to 14</td>
<td>-19 to 9</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>10.9</td>
<td>9.3</td>
<td>4.0</td>
<td>5.1</td>
<td>5.1</td>
<td>1.6</td>
<td></td>
</tr>
<tr>
<td>S.D.</td>
<td>5.44</td>
<td>5.55</td>
<td>3.43</td>
<td>3.54</td>
<td>5.83</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Total Gradient scores were computed by subtracting the Total score obtained under the Task-oriented condition from that obtained under the Academic Achievement-oriented condition of motive arousal.*
### Table XXXIII

**Descriptive Statistics on n Academic Achievement Scores**

*From stories written by female subjects under two conditions of motive arousal*

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Task-oriented</th>
<th>Academic Achievement-oriented</th>
<th>Total Approach Tendency score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>2 to 27</td>
<td>1 to 23</td>
<td>3 to 13</td>
</tr>
<tr>
<td>Mean</td>
<td>10.3</td>
<td>11.0</td>
<td>4.5</td>
</tr>
<tr>
<td>S.D.</td>
<td>4.63</td>
<td>4.56</td>
<td>2.79</td>
</tr>
</tbody>
</table>

*Total Gradient scores were computed by subtracting the Total score obtained under the Task-oriented condition from that obtained under the Academic Achievement-oriented condition of motive arousal.*
TABLE XXXIV
DESCRIPTIVE STATISTICS ON READING RATE AND COMPREHENSION ACCURACY
FOR MALE SUBJECTS

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Reading rate</th>
<th>Comprehension accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Initial</td>
<td>Final</td>
</tr>
<tr>
<td>Range</td>
<td>100 to 293</td>
<td>137 to 382</td>
</tr>
<tr>
<td>Mean</td>
<td>197.9</td>
<td>237.3</td>
</tr>
<tr>
<td>S.D.</td>
<td>57.95</td>
<td>59.71</td>
</tr>
</tbody>
</table>

*Reading rate refers to the number of words read per minute on the Robinson-Hall Reading Tests for Canadian History (initial test) and Russian History (final test) (45).*

*bComprehension accuracy refers to accuracy scores (percentages) computed by dividing the number of questions answered correctly by the number of questions tried (45).*
<table>
<thead>
<tr>
<th>Statistic</th>
<th>Initial</th>
<th>Final</th>
<th>Initial</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>105 to 354</td>
<td>129 to 338</td>
<td>13 to 94</td>
<td>37 to 91</td>
</tr>
<tr>
<td>Mean</td>
<td>204.7</td>
<td>228.2</td>
<td>55.7</td>
<td>64.4</td>
</tr>
<tr>
<td>S.D.</td>
<td>59.03</td>
<td>33.00</td>
<td>17.41</td>
<td>12.17</td>
</tr>
</tbody>
</table>

*aReading rate refers to the number of words read per minute on the Robinson-Hall Reading Tests for Canadian History (initial test) and Russian History (final test) (45).*

*bComprehension accuracy refers to accuracy scores (percentages) computed by dividing the number of questions answered correctly by the number of questions tried (45).*
### TABLE XXXVI

**DESCRIPTIVE STATISTICS ON WORKING RATE AND QUALITY OF NOTES**

**FOR MALE SUBJECTS**

<table>
<thead>
<tr>
<th>Statistic</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Range</strong></td>
<td>21 to 172</td>
<td>15 to 151</td>
<td>25 to 131</td>
<td>24 to 152</td>
<td>25 to 137</td>
<td>7.2 to 21.9</td>
<td>9.4 to 25.2</td>
<td>10.4 to 22.5</td>
<td>10.7 to 23.4</td>
<td>10.5 to 22.7</td>
</tr>
<tr>
<td><strong>Mean</strong></td>
<td>92.3</td>
<td>55.3</td>
<td>76.5</td>
<td>83.3</td>
<td>74.8</td>
<td>14.3</td>
<td>16.1</td>
<td>16.6</td>
<td>16.9</td>
<td>18.9</td>
</tr>
<tr>
<td><strong>S.D.</strong></td>
<td>46.4</td>
<td>32.5</td>
<td>30.1</td>
<td>35.1</td>
<td>29.1</td>
<td>4.25</td>
<td>3.93</td>
<td>3.56</td>
<td>3.16</td>
<td>2.37</td>
</tr>
</tbody>
</table>

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*a Working rate refers to number of words read per minute while taking notes.

*b Quality of notes refers to the rating of note quality computed on the basis of the rating procedures illustrated in Appendix D.*
### TABLE XXXVII

DESCRIPTIVE STATISTICS ON WORKING RATE AND QUALITY OF NOTES
FOR FEMALE SUBJECTS

<table>
<thead>
<tr>
<th>Statistic</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>34 to 172</td>
<td>15 to 117</td>
<td>13 to 131</td>
<td>18 to 152</td>
<td>18 to 163</td>
<td>7.2 to 22.7</td>
<td>8.4 to 25.4</td>
<td>8.1 to 25.0</td>
<td>10.7 to 24.5</td>
<td>14.7 to 24.8</td>
</tr>
<tr>
<td>Mean</td>
<td>102.2</td>
<td>62.0</td>
<td>84.1</td>
<td>91.3</td>
<td>94.5</td>
<td>16.1</td>
<td>19.0</td>
<td>18.7</td>
<td>18.2</td>
<td>19.9</td>
</tr>
<tr>
<td>Sd.</td>
<td>34.7</td>
<td>19.9</td>
<td>27.0</td>
<td>29.1</td>
<td>29.6</td>
<td>3.88</td>
<td>3.49</td>
<td>3.35</td>
<td>3.61</td>
<td>2.61</td>
</tr>
</tbody>
</table>

*Working rate refers to number of words read per minute while taking notes.

*Quality of notes refers to the rating of note quality computed on the basis of the rating procedures illustrated in Appendix D*.
TABLE XXXVIII

DESCRIPTIVE STATISTICS ON VERBAL ABILITY (O.S.P.E.)
FOR MALE AND FEMALE SUBJECTS

<table>
<thead>
<tr>
<th>Statistics</th>
<th>Male (N = 32)</th>
<th>Female (N = 42)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>13 to 93</td>
<td>13 to 111</td>
</tr>
<tr>
<td>Mean</td>
<td>47.7</td>
<td>53.3</td>
</tr>
<tr>
<td>S.D.</td>
<td>17.79</td>
<td>21.85</td>
</tr>
</tbody>
</table>

*Level of verbal ability was based on the subject's performance (raw score attained) on the Ohio State University Psychological Examination (O.S.P.E.), Form 25.*
### TABLE XXXIX
DESRIPTIVE STATISTICS ON SCRAMBLED WORDS TASK
FOR MALE SUBJECTS

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Trial I</th>
<th>Trial II</th>
<th>Trial III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Range</td>
<td>3 to 24</td>
<td>3 to 24</td>
<td>2 to 23</td>
</tr>
<tr>
<td>Mean</td>
<td>13.8</td>
<td>13.2</td>
<td>13.2</td>
</tr>
<tr>
<td>S.D.</td>
<td>5.91</td>
<td>6.01</td>
<td>5.37</td>
</tr>
</tbody>
</table>

*Each trial consisted of two, one and one-half minute work periods. Scores represent number of words correctly unscrambled in the time allotted.*
### TABLE XL

DESCRIPTIVE STATISTICS ON SCRAMBLED WORDS TASK
FOR FEMALE SUBJECTS

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Trial</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
<td>II</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>5 to 34</td>
<td>3 to 31</td>
<td>6 to 33</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>16.4</td>
<td>17.1</td>
<td>16.4</td>
<td></td>
</tr>
<tr>
<td>S.D.</td>
<td>7.05</td>
<td>7.67</td>
<td>5.71</td>
<td></td>
</tr>
</tbody>
</table>

*Each trial consisted of two, one and one-half minute work periods. Scores represent number of words correctly unscrambled in the time allotted.*
APPENDIX B

PRESENTATION OF TRAINING MANUAL FOR INSTRUCTORS
MANUAL FOR

READING SELECTIONS

ON

TYPICAL TEXTBOOK MATERIAL

Contents

Purpose for using the tests
Suggested Outlining Procedure
Instructions for Administration
PURPOSE FOR USING THE TESTS and INSTRUCTIONS TO THE STUDENTS REGARDING THEM:

"The primary goal of Psychology Hall is to help you to become more effective and efficient students in college. Two study skills emphasized in class are: taking meaningful and systematic 'working' notes and increasing reading rate. Proficiency in these skills is quite important to you. As you probably know, in college, students do well partly because they are intelligent and partly because they are able to become more skillful than their fellow students in the way they study.

Suppose, for instance, that you knew that whether or not you would be promoted on a job depended on your showing a certain level of proficiency on a particular skill after a period of training.

What we are attempting to do in this class is very similar to the above situation. We are interested in seeing how much improvement, and how rapidly you can improve in both note-taking and reading skills.

We think that this kind of training is of particular value to you—in that, it will show you to what extent you've developed 'higher-level' study skills.

For these reasons, then, I want to urge you to do your very best on every one of the training sessions. I will consider your performance at these sessions as the best measure of the extent to which you've developed a use of these study skills."

To the instructor: The above instructions to the students are designed to be Academic Achievement-oriented.
SUGGESTED OUTLINING PROCEDURE:

It may be well to emphasize the following method of outlining, as a method of systematically organizing what we read.

1. Roman numerals (I, II, etc.) followed by a period, indicate the major sections of the reading material, e.g., those headings which appear centered on the page. These numerals should not be used to indicate or point-out the Title of the article.

2. Capitalized letters of the alphabet, followed by a period, indicate the major sub-divisions of the various sections, e.g., those headings which stand out at the side of the page or at the beginning of a paragraph.

3. Arabic numerals, followed by a period, constitute the next break-down, and these indicate the essential detail under the major sub-topics.

4. Small letters of the alphabet, followed by a period, indicate the small quantity of essential detail used to clarify some other detail of importance.

5. A sample of the above outline scheme:

I.

A.

1.

a.

1) a)

(1)

(a) etc.
INSTRUCTIONS FOR ADMINISTRATION:

A. Instructions to the Students: (Note: You do not necessarily need to read these instructions verbatim--make them sound alive and as natural as possible.)

"This is a training session on note-taking and reading rate.

You are to read and take notes on this article for a period of 20 minutes. Some of you may finish before time is called. So, for the last five minutes of working time, as each minute goes by, I'll put the time elapsed on the blackboard, for example: 15, 16, 17, etc. 20, 21, 22, etc.

If you finish before I tell you to stop, please record the time it took you to complete the article and your notes.

So you will know at what working rate you were reading and taking notes on this article, when you finish, please record the number of the line of the last phrase you read. Each line of the article has a number before it. So as to assure correct recording, also record the last three or four words of the last phrase you read. Do this on the bottom of your last page of notes.

I'd like to urge you to do your very best to take meaningful 'working' notes while reading at your optimum rate. I'll consider your performance at this training session as the 'best' measure of the extent to which you've developed a use of these study skills.

Do you have any questions? If not, go ahead."

B. Instructions to Psychology 411 Instructors:

1. Time limits for the series of five articles are as follows:
   Test 1 - 25 minutes; Test 2 - 20 minutes; Test 3 - 20 minutes; Test 4 - 20 minutes; Test 5 - 25 minutes.

2. These tests should be presented to the students in the following order:
   1st session - Test 1; 2nd session - Test 3; 3rd session - Test 2; 4th session - Test 4; and 5th session - Test 5.
APPENDIX C

PRESENTATION OF TEST MATERIALS AND INSTRUCTIONS
SCRAMBLED WORDS TEST - I

<table>
<thead>
<tr>
<th>Page A</th>
<th>Page B</th>
</tr>
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<tbody>
<tr>
<td>D E I R T</td>
<td>E C R P O</td>
</tr>
<tr>
<td>A T E K</td>
<td>R E E Y V</td>
</tr>
<tr>
<td>H N O T H</td>
<td>N A E R O S</td>
</tr>
<tr>
<td>T U J S</td>
<td>N T U R</td>
</tr>
<tr>
<td>S I H W</td>
<td>I S D A</td>
</tr>
<tr>
<td>R R U N E T</td>
<td>W L A L</td>
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<tr>
<td>D R O N W</td>
<td>L A M L S</td>
</tr>
<tr>
<td>E M O N W</td>
<td>N W D O</td>
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<tr>
<td>H E S R O</td>
<td>E K A M</td>
</tr>
<tr>
<td>S R O T</td>
<td>G O M C I N</td>
</tr>
<tr>
<td>H N E W</td>
<td>N I F E</td>
</tr>
<tr>
<td>R K W O</td>
<td>N A P L T</td>
</tr>
</tbody>
</table>

*These tests were administered to subjects who were working under Task-oriented condition of motive arousal.*
These tests were administered to subjects who were working under academic achievement-oriented condition of motive arousal.
### SCRAMBLED WORDS TEST - II (cont'd.)

<table>
<thead>
<tr>
<th>Page C</th>
<th>Page D</th>
</tr>
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<tbody>
<tr>
<td>IRFE</td>
<td>LNAP</td>
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<tr>
<td>WITA</td>
<td>EODCNS</td>
</tr>
<tr>
<td>VYRE</td>
<td>DLEH</td>
</tr>
<tr>
<td>AERG</td>
<td>RBNGI</td>
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<tr>
<td>ETIHWE</td>
<td>YALP</td>
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<tr>
<td>TREGHEV</td>
<td>EBAGN</td>
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<tr>
<td>OHWLE</td>
<td>WTNEYT</td>
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<tr>
<td>GONSTR</td>
<td>ETWRI</td>
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<tr>
<td>ROUF</td>
<td>OHMW</td>
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<td>MJLIEE</td>
<td>NITO</td>
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<td>DOLH</td>
<td>LASHL</td>
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<td>LAPH</td>
<td>EVIG</td>
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</table>
### SCRAMBLED WORDS TEST - II (contd.)

<table>
<thead>
<tr>
<th>Page E</th>
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</thead>
<tbody>
<tr>
<td>TORNFP</td>
<td>ARETPH</td>
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<tr>
<td>KOTO</td>
<td>NEATK</td>
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<tr>
<td>REAH</td>
<td>KEIL</td>
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<td>ELVO</td>
<td>HICDL</td>
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<tr>
<td>SSEYHT</td>
<td>REAN</td>
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<td>RAELYL</td>
<td>IPHS</td>
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<td>YNAM</td>
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<td>AENN</td>
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<td>OTOSD</td>
<td>BCAK</td>
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<td>IDNW</td>
<td>ATHT</td>
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<td>NOGE</td>
<td>REPWO</td>
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<td>NWOT</td>
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</tbody>
</table>
INSTRUCTIONS FOR ADMINISTRATION OF THE PICTURE INTERPRETATIONS TEST
UNDER TASK-ORIENTED CONDITIONS OF MOTIVE AROUSAL

"I'm trying out some tests on the thought processes. They're in the developmental stage, and I need some data so as to know what might be made of them. Actually, you can't really call them tests yet, as I'm just trying them out, but I think you'll find them interesting.

In order for us to get the best results, I'd like you all to follow these instructions closely.

I'll show some pictures on the screen for about twenty seconds each, then you'll have about five minutes to write a story about each one. There are no right or wrong answers involved, so feel free to make up any kind of story you want. However, don't merely describe the picture. Tell a story about it. You may begin writing anytime after the picture is shown. Don't worry about grammar or spelling.

Notice there is a separate page for each picture to be shown, so you'll use one page for each story. The questions on the sheets are there merely to guide your thinking and to help you cover all the elements of a plot in the allotted time.

I'll keep time and tell you about when you should go on to the next question. Plan to spend about a minute on each question. However, you may go on before I tell you, if you wish. Are there any questions?"
INSTRUCTIONS FOR ADMINISTRATION OF THE PICTURE INTERPRETATIONS TEST UNDER ACADEMIC ACHIEVEMENT-ORIENTED CONDITIONS OF MOTIVE AROUSAL

"You'll remember two weeks ago I didn't tell you much about the tests or about what I'm doing in this research. Today, I'd like to tell you about the sort of things which are involved.

At the University of Michigan, results seemed to show whether a person could be a top student both scholastically and socially. That is, a top student in his class work, fraternity, sorority, or other group. In addition, they seemed to indicate whether a person tended to be respected by both professors and fellow students for the various things he or she did in college.

The tests seemed to be estimates of a person's ability to: see relations quickly; to make order out of incomplete situations; and to change and see things from a different point of view, rapidly. These abilities are some of the most important aspects of college work.

Students at the University of Michigan have done very well, so today I'd like to see how well you people can do in comparison.

In order for us to show the best results, I'd like you all to follow these instructions closely.

Please do not open your booklets beyond the point at which we're working. I'll tell you when to turn the pages.

I'll show some pictures on the screen for about twenty seconds each, then you'll have about five minutes to write a story about each one. There are no right or wrong answers involved, so feel free to make up any kind of a story you want. However, don't merely describe the picture. Tell a story about it. You may begin writing anytime after the picture is shown. Don't worry about grammar or spelling.

Notice there is a separate page for each picture to be shown, so you'll use one page for each story. The questions on the sheets are there merely to guide your thinking and to help you cover all the elements of a plot in the allotted time.

I'll keep time and tell you about when you should go on to the next question. Plan to spend about a minute on each question. However, you may go on before I tell you, if you wish. Are there any questions?"
APPENDIX D

PRESENTATION OF MANUALS FOR SCORING
QUALITY OF NOTES
PICTURE INTERPRETATIONS TEST
The purpose of this manual is to set forth the procedures to be used to rate the quality of notes written by students in their study of typical textbook material.

PROCEDURE:

The task of the rater in using this manual is to rate each set of notes with respect to five characteristics of note-quality: (a) use of an outline scheme, (b) use of space, (c) relationship between headings, sub-headings, and detail, (d) use of detail, and (e) wordiness.\(^1\)

First, the judge is to decide which of the statements with respect to the characteristic of "use of an outline scheme" best describes the set of notes he is rating. This judgment is to be made on all the sets of notes obtained from the subjects of the investigation, independently of the other quality characteristics, to avoid any chance of systematic bias with respect to judgments. After choosing the statement which describes the quality of notes most accurately, the rating value representing that statement of quality is then assigned to that particular set of notes. Second, judgments are to be made on the factor "use of space," and so on, for the remaining characteristics.

The total rating value for a given set of notes is computed by summing the scores assigned with respect to each quality factor. This total is thought to represent the "general quality" of the notes in question.

\(^1\)The procedures used for the development and refinement of the rating scale are discussed in Chapter IV, pp. 98 to 102.
A. **Use of an Outline Scheme**

1.2 - No coherent scheme of outlining is used; some of the material may be in paragraphical form with little or no attempt to outline it.

1.8 - Lead and sub-topics are not distinct; the tendency is to merely list points.

2.4 - An outline scheme of some sort is used, however, it does not help in grasping an over-all comprehension of the material at a glance.

3.1 - Some outline scheme is used, but it is not used consistently; labeling and indentation is correct at times, but not so at others.

3.9 - Most points are in outline form, however, a few inconsistencies in the labeling system may be in evidence.

4.9 - Most headings are well placed with topic and sub-topics numbered or labeled correctly.

5.7 - Systematic use of an outline scheme throughout; headings and sub-headings are all denoted, i.e., alphabetized and/or numbered so that an over-all comprehension of the material can be grasped at a glance.

B. **Use of Space**

2.6 - Space is not used to help one see the relationship between items at a glance; items are not distinct.

3.1 - Notes are in one spot of the page only; either off to one side or just in the middle; lengthwise they may be cramped together or too spread out.

5.2 - Judicious use of available space, so that it is easy to see the relationship between items at a mere glance.
II - ORGANIZATION OF THE NOTES

A. Relationship between headings, sub-headings, and detail

0 - None of the following statements seem to be descriptive of this set of notes with respect to this characteristic of working notes.

1.4 - Sub-points (sub-headings and/or detail) are generally unrelated to the main headings: breakdown of the material does not convey the organization of the material as the author intended it.

2.9 - Relationship between sub-points and lead topics is not always clear.

4.1 - Relationship between topics as the note-taker presents them is accurate, however, the organization is different from that as the author presented the material.

5.4 - Relationship between topics, especially between principal point and the illustration or example of it, is accurate; the relationship between topics reflects the organization of the material as the author intended it.

III - PHRASING OF THE NOTES

A. Use of detail

1.5 - So many unneeded details are in evidence (or most of the essential details are lacking) that the main theme is almost lost.

2.8 - Frequently unneeded details (or not enough of the essential details) are included, particularly with reference to examples and illustrations of the main points.

3.9 - A little more detail than is needed, however, most of the essential points are noted.

5.1 - Most of the notetaker's attention is to essential detail, rather than too much involvement in that which is non-essential.

5.8 - Only the essential details of the main points are included.
B. Wordiness

1.9 - An excessive amount of wordiness is evident.

2.8 - Only little use is made of cue words and phrases; most phrases are complete and too lengthy.

3.8 - A few somewhat lengthy phrases or direct quotes from the text may be used, however, the notes tend to be brief in other respects.

4.4 - Abbreviating long words and the use of cue words is employed.

5.2 - Use of brief phrases instead of long phrases throughout and the notetaker tends to use his own phrases rather than quotes from the text.
The task of the judge in using this manual is to decide whether or not stories written in response to the pictures of this test contain any reference to an Academic Achievement goal. The criterion accepted for measuring academic achievement motivation is the respondent's choice of certain classes of academic goal-oriented thoughts written in response to the pictures of this test.

The purpose of this manual is to define the scoring categories and offer illustrative examples of stories scored by this method of content analysis.

The description of a scoring category will take much greater time than would be required to use it once it is understood. Therefore, the complexity and detail of the next pages should not be taken as evidence that this scoring system is intrinsically complex, difficult to learn, or tedious to apply. The scoring criteria need to be spelled out in detail for these reasons: (1) the scoring involves classification of response elements by objective criteria rather than the more complex methods often employed to score and interpret TAT's; and (2) there are many arbitrary decisions that the judge will need to make in using this system so as to handle the response elements which refuse to fit readily into the various categories. In most cases, scoring will be fairly simple, but in a few instances it may be somewhat difficult. Consequently, the scoring definitions are stated in sufficient detail to handle these difficult cases.
The scoring details to be followed are modifications of those defined by McClelland and others in their recent text.¹

SCORING PROCEDURE:

Step 1.

In this step the judge is to decide whether or not the story contains any reference to an Academic Achievement goal which would justify his scoring the sub-categories (Instrumental Activity, Anticipatory Academic Goal States, and so on) as academic achievement-related.

A. Definition of Academic Achievement Imagery (AAI).

By academic achievement goal is meant academic success in competition with some academic standard of excellence. That is, the academic goal of some individual in the story is to be successful in terms of competition with some academic standard of excellence. The individual may fail to achieve this goal, but the concern over competition with this standard still enables one to identify the goal sought as an academic achievement goal.

Competition with an academic standard of excellence is perhaps most clear when one of the characters is engaged in competitive academic activity where doing as well or better than someone else is the primary concern. Often, however, competition with an academic standard of excellence is evident in the concern of one of the characters with how well a particular academic task is being done, regardless of how well someone else is doing. Any use of adjectives of degree (good, better,

best) will qualify so long as they evaluate the excellence of academic performance.

Stories are scored for Academic Achievement Imagery only when one of the criteria listed below is met. If the story is scored for AAI, it is assigned a score value of +2.

1. **Competition with an academic standard of excellence.**

   a. One of the characters in the story is engaged in some competitive academic activity where doing as well as or better than others is **actually stated** as the primary concern. Studying to receive a good grade for his efforts is a typical example.

   b. If one of the characters in the story is engaged in some competitive academic activity, but the desire to do as well as or better than others is **not explicitly** stated, then (1) affective concern over goal attainment, and (2) certain types of instrumental activity are considered as indicating that the desire to compete academically is implicit in the story. Examples of (1) would be: "The boy has his term paper returned and feels proud." "The fellow is worried because he can't seem to grasp the meaning of his assignment." Examples of (2) would be: "The boy is working very carefully on his term paper." "He feels he should be studying, but is daydreaming instead."

   c. Often the academic standard of excellence involves no academic competition with others but academic performance is based on **self-imposed requirements of good performance.** In this case, in order to score for AAI what is needed are words to the effect that a good, thorough, and effective job is desired, or statements showing the
affective concern or instrumental activity that will allow such an inference. Typical examples are: "The boy is studiously preparing his homework." "The fellow is worried that he isn't understanding the assignment."

In the above criteria, distinction is made between statements of the intensity and quality of instrumental acts. Working hard, or studying hard would be evidence of concern over academic achievement only when excellence at the academic task demanded speed or intense effort, for one may work hard to complete an academic task for reasons other than personal academic achievement. For instance, "The boy is working hard to finish his assignment," may indicate only that he wants to go out and play or perhaps that he is late with his term paper and is rushing to get it in. In neither of these examples is there evidence of concern over an academic standard of excellence, and so there is no basis for scoring AAI. However, a statement such as "He is working slowly with great thoroughness" implies concern with accuracy, an academic standard of excellence. In this instance, and in ones like it, Academic Achievement Imagery would be scored.

2. Unique Academic Accomplishment.

Occasionally one of the characters in the story is pictured as accomplishing other than the run-of-the-mill academic task. Here, there need be no explicit statement of concern over the outcome, for it is inferred that the person is competing with an academic standard of excellence, that is, he is doing something unique which will be generally accepted as a personal academic accomplishment.
3. Long-term Academic Involvement:

Frequently one of the characters in the story is seen as attaining or pursuing a long-term academic achievement goal, e.g., graduating from school or college, becoming a physician, lawyer, or other examples of career involvement which permit the inference of competition with an academic standard of excellence. This type of theme is scored for AAI unless it is made explicit that another goal is primary, e.g., personal security, or food for the children.

When rather routine academic tasks or performances are shown to be definitely related to long-term academic achievement interests AAI is scored. "Studying for an exam" would not be scored unless the exam were explicitly related to "going on to medical school" or "graduating from college" both being long-term academic achievement goals. The relationship of a specific task to a long-term academic achievement goal must be clearly stated and not inferred.

B. Doubtful Academic Achievement Imagery (TAI).

Stories containing some references to academic achievement but which fail to meet one of the three criteria for Academic Achievement Imagery are scored Doubtful Academic Achievement Imagery (TAI), are assigned a score value of plus one (+1), and are not scored further for academic achievement-related sub-categories. The T chosen as a symbol for this category indicates that most frequently the stories to be classified as doubtful are ones in which one of the characters is engaged in a commonplace academic task or solving a routine academic problem. Whenever there is doubt about whether or not one of the three criteria for
academic Achievement Imagery has been met, and the story is not totally unrelated to academic achievement, it is classified TAI.

C. Unrelated Imagery (UI).

Stories in which there is no reference to an academic achievement goal or in which some reference is made to a commonplace academic task that is not related to an academic achievement goal, but which is important only in terms of some other personal goal, are scored Unrelated Imagery (UI), are assigned a score value of zero (0), and are not scored further.

The difference between a story scored TAI and one scored UI is simply that the TAI story usually contains reference to some commonplace academic task goal and often contains other academic task-related subcategories but fails to meet one of the three criteria for scoring Academic Achievement Imagery; whereas the story scored UI fails to have any reference to academic achievement or if a commonplace academic task is mentioned it is seen as related to another personal goal rather than to an academic achievement goal.

The three imagery categories (UI, TAI, and AAI) comprise a continuum of increasing certainty that the story contains imagery related to academic achievement motivation. Often the judge may feel that a story that must be scored TAI because it fails to meet any one of the criteria for AAI, should have been scored for AAI and the other achievement-related sub-categories as well. Experience by McClelland and others indicates that while undoubtedly some achievement stories are lost according to these criteria, in the long run, rigid adherence to the stated criteria is the only means of assuring high scorer reliability.
Step II.

After each story has been scored for Academic Achievement Imagery, Doubtful Academic Achievement Imagery, or Unrelated Imagery, those stories scored AAI are scored further for certain academic achievement-related sub-categories.

In the scoring procedure for scoring these sub-categories a distinction is made between approach academic achievement-related imagery and avoidant imagery. However, both approach and avoidant characteristics of these sub-categories are assigned a score weight of plus one (+1) and each feature is scored only once per story.

An index of academic achievement motivation is obtained by summing the category scores for a particular story. This score represents a summation of all category scores for that story—AAI, TAI, UI, and the academic achievement-related sub-categories. A total n Academic Achievement score for any one individual is the total of all scores obtained from the six stories written.

A. Stated Need.

1. Stated need for academic accomplishment (AN+). Someone in the story states the desire to reach an academic achievement goal. Expressions such as "He wants to be a doctor," "He hopes to succeed in college" are the clearest examples. Very strong indications of the presence of the motive in phrases like "He is determined to get a good mark" are also scored. The accomplishment desired must be specific to the academic situation to be scored, and is scored only once per story even when it appears more than once in varying forms. Need for academic
achievement is not inferred from Instrumental Activity. It may seem quite obvious to the judge that the characters who are working furiously toward an academic achievement goal must want to succeed. Need for academic accomplishment is scored, however, only when there is a definite statement of academic achievement motivation by one of the characters. Another kind of statement of academic achievement need which is not scored is a statement by one character which defines an academic achievement goal for another character. An example of this is: "The teacher wants the student to study his assignment."

2. Stated need for help in circumventing adverse academic achievement evaluation (AN-). Someone in the story states the desire for help of some type which would ease the threat or pain of academic failure. These needs can refer to a desire to leave the situation in which academic achievement evaluation might take place, or a desire for help in circumventing an academic achievement obstacle.

B. Instrumental Activity.

1. Instrumental activity leading to academic accomplishment (IA+). One or more of the characters in the story demonstrate overt or mental activity which indicates that something is being done about attaining an academic achievement goal. There must be an actual statement of activity within the story independent of both the original statement of the situation and the final outcome of the story for IA+ to be scored. If the first sentence of a story describes such a situation as "The student is working on a term paper" and there is no further statement of Instrumental Activity in the story, IA+ would not be scored.
Neither would IA+ be scored if a story went on with no statement of Instrumental Activity and ended, "They will finish the term paper," If after the statement of the situation, a statement appeared such as "They completed two important phases of their assignment yesterday" IA+ would not be scored. This is considered as a description of the outcome of previous acts with no word indicating actual striving.

2. **Instrumental activity leading away from academic accomplishment (IA-)**. One or more of the characters in the story demonstrate overt or mental activity which indicates that something is being done about departing from or avoiding the academic situation. There must be an actual statement of activity within the story independent of both the original statement of the situation and the final outcome of the story for IA- to be scored. An example is: certain statements of daydreams which occur in an academic situation; however, not all daydreams which occur in an academic situation are scored IA-, for if they are of some successful academic achievement, or if the major thema of them is unrelated to the solution of an academic problem, IA- would not be scored.

C. **Anticipatory Academic Goal States.**

1. **Anticipation of academic success (AGa+)**. Someone in the story anticipates the academic success he will achieve. Expectations that academic work will be well-received, dreams of someone as a great surgeon, scholar, etc., are examples. However, academic achievement-related anticipations must be related to the academic achievement goal of the story to be scored.
2. Anticipation of academic failure (AGa-). Someone in the story anticipates possible academic failure, doubts someone else's academic ability, or is concerned over the possibility that some academic activity will not be effective, expects the worst, or is wondering whether or not he will succeed.

This category includes all academic achievement-related anticipations that are not clearly positive. Thus, doubtful statements such as, "He is wondering what the outcome of the test will be" are scored AGa-.

D. Affective States.

1. Positive emotional concomitants of academic accomplishment (A0+). A0+ is scored when someone in the story experiences: (a) a positive affective state associated with active mastery or definite academic accomplishment ("He enjoys studying," "He is proud of the grade he got," "They were very satisfied with their term paper"), or (b) definite objective benefits as a result of successful academic achievement which allow the inference of positive affect ("His ability is acknowledged by all," "The students were proud of him").

A0+ indicates more than mere successful instrumental activity. "He works his way through college and becomes a doctor" is scored IA+, but A0+ would be scored only when a statement of positive affect is included, e.g., "He becomes a successful doctor and experiences a deep sense of satisfaction," or if there are adequate indications of objective benefits associated with his academic success from which positive affect might be inferred with little doubt, e.g., "He becomes a famous surgeon."
There is another arbitrary distinction which must be made. Positive affect may occur within the story, or it may be associated with the outcome of the story. It is scored only once per story and should only be scored when there is a definite statement of positive affect associated with the academic achievement-directed activity or a statement of objective benefits above and beyond the statement of successful instrumental activity.

2. **Negative emotional concomitants of academic failure (AG-)**. AG- is scored when someone in the story experiences: (a) frustration of the academic achievement-directed activity; (b) a negative affective state associated with failure to attain an academic achievement goal ("He is disturbed over his inability to make grades," "He is discouraged about his past failure in Math," "He is disgusted with himself when he's in class"), or (c) the objective concomitants of complete failure and deprivation in an academic situation which allow the inference of negative affect ("He becomes the laughing stock of his class.").

These negative emotional states must be experienced as the result of poor academic performance or low evaluation in an academic situation. Almost any negative affect which occurs in the academic achievement situation is scored, unless specifically attributed to other non-academic achievement-related factors.

E. **Press**.

1. **Nurturant Press (ANup)**. Forces in the story, personal in source, which aid the character in the story who is engaged in on-going
academic achievement-related activity are scored ANup. Someone aids, sympathizes with, or encourages the person striving for academic achievement. The assistance must be in the direction of the academic achievement goal and not merely incidental to it. For example, "The instructor is trying to straighten things out for the student and is encouraging him." ANup must always be considered from the point of view of the character or characters in the story who are striving for academic achievement.

2. **Hostile Press, Obstacles or Blocks.**

   a. **Hostile Press (AHp).** Stories are scored for AHp when there is overt criticism of one character by another for inadequate academic performance.

   b. **Personal Obstacles (ABp).** ABp is scored when various types of obstacles are stated as located within the individual (lack of confidence, a conflict to overcome, inability to make decisions, or some past failure in an academic situation). These obstacles can be: (1) impediments to avoidance of the academic achievement sequence, e.g., "He would like to skip school but feels that he must go," or (2) impediments to an academic achievement sequence, e.g., "He feels confused when he takes an exam," "He has failed to study sufficiently," or (3) any mention of personal inadequacy in an academic situation, including statements of lack of preparation or lack of effective instrumental action.
c. **Environmental Obstacles (ABw).** ABw is scored when statements are given which indicate that the block to be overcome is part of the environment, i.e., the block is located in the world at large, e.g., "His family couldn't afford to send him to medical school," "The competition at this school was too keen for him." When there is some doubt about whether the block is located in the individual or in the world, ABw is scored. It is necessary to make a distinction between "apparent obstacles" which really define the academic achievement goal of the story and "real obstacles" to on-going academic-goal-directed behavior. Only external blocks of academic achievement activity which do not merely define the task are scored ABw, because the block must interrupt goal-directed activity which is in progress in order to be scored. This distinction is made only in the case of ABw. Indications of past academic failures are scored ABp whether they interfere with the immediate goal-directed activity or not.

Personal and Environmental Obstacles and statements of Hostile Press may occur in the same story, but only one of these subcategories is scored per story.

F. **Academic Achievement Thema.**

1. **Hope of Academic Success Thema (ASTh).** ASTh is scored when the story contains no reference to a competing theme not related to academic achievement and the hope of academic success imagery is elaborated in such a manner that it becomes the central plot or theme of the story. Striving for an academic achievement goal and eventual attainment of the goal is the central plot of the story. If there is any doubt about the
hope of academic success imagery being central to the plot, ASTh is not scored.

2. Fear of Academic Failure Theme (AFTh). AFTh is scored when the story contains no reference to any successful academic striving whatsoever and the fear of academic failure imagery is elaborated in such a manner that it becomes the central plot or theme of the story. The whole story must be an elaboration of the fear of academic failure behavior sequence to be scored AFTh.
Illustrative Stories

(1) Stories illustrating the various criteria of Academic Achievement Imagery.  

   a. Competition with an academic standard of excellence.

   1. This boy was asked to write a scientific thesis. In his desire to be a writer of important themes, he has gone into an advanced English course. He is attempting to correlate and to pull together all he knows of the subject. He wants to give it a different twist, the same old story but in a new and different way. He will work hard and prepare a fine theme with a new twist, and consequently go on writing.

   2. The boy is taking an examination. He is a college student. He is trying to recall a pertinent fact. He did not study this particular point enough, although he thought it might be on the examination. He is trying to recall the point. He can almost get it but not quite. It's almost on the tip of his tongue. Either he will recall it or he won't. If he recalls it, he will write it down. If he doesn't, he will be mad.

   (Evidence of Instrumental Activity and affective arousal as a result of non-attainment of the academic achievement goal in this specific task situation is what keeps the imagery from being considered TAI.)

   3. The student is worrying about his two exams coming up Friday, the first night of the May frolic. The student has spent most of his time previous to this, studying information for his research paper in English 117. He is wondering how he can ever manage to study sufficiently enough to be able to pass the exams while he is so preoccupied with thoughts of the frolic. He will study 'like mad' for a few hours, and then 'knock off' hoping for the best.

   (Note that it is the student's affective arousal 'worrying' concerning the threat of not reaching his academic achievement goal 'passing the exam' which leads to the decision to score this story AAI and not the vigorous Instrumental Activity of the last sentence 'studying like mad.' A distinction must be made between evidence of concern over academic accomplishment and evidence of intense Instrumental

2Stories were culled from several sources. These include the textbook by McClelland, et al (30), articles by Atkinson (3) and Moulton (37), and material obtained from stories written by students who were subjects in a pilot-study conducted by the writer.  

165
Activity. Stories with only intense Instrumental Activity will not be scored AAI unless one of the three criteria for Academic Achievement Imagery is met.)

b. **Unique Academic Accomplishment.**

1. An engineering instructor is talking to an engineering student. The prof has some special assignment that he wants done, and the student is a real bright guy in this particular thing. The prof wants the student to start working on a specially designed carburetor for a revolutionary engine that the department is developing. The prof has thought out the problem some. The job will come off OK, and the engine will revolutionize the automobile industry. Both will get recognition from the school and industry for their work.

c. **Long-term Academic Involvement.**

1. This guy is taking an examination for entrance into college. He has studied very hard in high school hoping all along that he will some day go to college. Now that he sees how difficult the exam is, he is very worried that he may fail it. He is thinking so much about his failing that he can't concentrate on the test itself. He will just barely pass the test.

(The first sentence of this story is an example of a specific task being related to a long-term academic achievement goal. The second sentence reiterates the long-term concern. There is also affective concern over the possibility of failing the test that would warrant scoring this story AAI.)

2. The boy is a thinker, bored with his schoolwork he is attempting to do. His mind wanders. He thinks of his future. He has completed all but the last of his high school career. The boy is eager to graduate. He has faith in his capabilities and wants to get started on the job he has lined up, dreaming of advancements. He will graduate and do all right on the outside.

3. This is a father and a son. The father is an immigrant, and his son has stopped to see his father. The son has been successful in college largely because of the training he received in high school. The old man is looking with a feeling of pride at his son and feels that he is very fortunate to have many things he himself never had. The son realizes this pride in his father's thoughts. Later, the son will try to make it up to his father by trying to give him some of the things he gave up in order to educate his son.
(2) Stories illustrating Doubtful Academic Achievement Imagery.

a. Jim is in the midst of deep thought trying to pick the answer to a problem on his exam out of thin air. He is evidently having a difficult time with it. Jim probably didn't prepare himself too well and doesn't have the necessary things at his fingertips. Jim is trying to remember some formula. If he could just remember it, he could solve his problem. Jim will skip to the next problem in a short time and then return to this one.

(Note that being in an exam situation is not scored AAI in this instance, since there is no evidence of concern over the outcome either in the form of a stated need to do well, working carefully, affective arousal over the possibility of success or failure, and so forth.)

b. The person is a student in school. He was studying until a distraction occurred which was the teacher who came up. The student was studying. The teacher had disciplined him for his actions in class telling him to study a story for repetition later. He doesn't think much of him this day and dislikes him for his ways of teaching. The student will not do too well in the repetition exercise, and as a result further punishment will be applied.

(The academic achievement goal of the story is studying. There is no evidence of concern over scholastic mastery, perfection, or the possibility of failure, so the story is scored TAI.)

(3) Stories illustrating Unrelated Imagery.

a. A young fellow is sitting and resting his head on one hand. He appears to be thinking of something. His eyes appear a little sad. He may have been involved in something that he is sorry for. The boy is thinking over what he has done. By the look in his eyes we can tell that he is very sad about it. I believe that the boy will break down any minute if he continues in the manner in which he is now going.

b. The boy is daydreaming of some picture he may have seen or is projecting himself into the future, putting himself into the situation as it would be if he were a man. The boy has seen a movie. He is thinking of how he would like to be in the situation as seen. The daydream, if not too vivid or realistic, will be terminated so that he can engage in activity more related to his present needs.
c. An elderly man is talking to a much younger man. A problem has presented itself in which the older guy needs the younger man's help. The younger fellow is listening to what is being said and thinking over the situation. A conclusion will be reached, but the older guy will not accept everything presented by the younger.

(4) Stories illustrating the academic achievement-related sub-categories.

(Note that all the examples which follow also fulfill one of the criteria for scoring Academic Achievement Imagery—AAI.)

a. Stated Need.

1. Stated need for academic accomplishment (AN+).

a) The young student wishes to become a doctor. He can visualize himself performing an operation. He received a toy doctor's kit for a present several years ago, and several of his friends are planning to be doctors. He is thinking of the pleasant or glamorous side of the picture and not the long years of study. He will be unable to pass pre-med school, so he decides to become a lab technician as he wants to stay in the field.

2. Stated need for help in circumventing adverse academic achievement evaluation (AN-).

a) The student is enrolled in Engineering school, and has found it difficult to keep up with the level of work that the profs want. He wishes he could find some fellow student to help him in his work so he won't flunk out. He can't, so he gets poor marks again this quarter and gets put on probation. He feels bad about this, and tells his dad he wants to go to work.

b. Instrumental Activity.

1. Instrumental activity leading to academic accomplishment (IA+).

a) A boy is dreaming of being a doctor. He can see himself in the future. He is hoping that he can make the grade. It is more or less a fantasy. He has seen many pictures of doctors and it has inspired him. He will try his best, and hopes to become the best doctor in the country. He will become the best doctor in the U.S. He will be an honest man too. His name will go down in medical history as one of the greatest men.
2. **Instrumental activity leading away from academic accomplishment (IA-).**

a) The boy is thinking that he does not know whether he can cover the material the night before the test. His roommate is working hard. The boy is trying to decide whether to go to bed or to study all night. He has been swamped with work and has delayed studying until this late hour so as to do other things which he didn't want to miss. He finds that the work is difficult and hasn't enough time for it. If I stay up, I'll miss much in reading later. If I go to bed, I'll get up early but maybe won't have time to finish the work. He wants to get the work covered thoroughly to pass with a good mark. He goes to bed and gets up in the morning and studies but not well enough. Consequently, he doesn't do well on the test and shoots his average out the window.

c. **Anticipatory Academic Goal States.**

1. **Anticipation of academic success (AGa+).**

a) The prof is advising the student on the choice of occupation. The prof is a doctor and he sees prospects in this student to become a great surgeon. The student has just returned from the Army, and he is disappointed with the attitude of civilians and has given up hope of being a surgeon. The student is thinking that it is useless to become a great healer if people are going to fight wars which amount to nothing more than mass murder. The doctor will convince him that the world is not as bad as he believes, and he will re-enter medical school.

(Note that the Anticipatory Academic Goal State need not refer to the person who is ultimately going to achieve the goal in question. In this story the doctor is anticipating a successful future for the young student.)

2. **Anticipation of academic failure (AGa-).**

a) A father is telling his son not to worry while in college because his health is more important. The son has flunked a few exams and feels very bad about it. His father has noticed his unusual behavior and thinks he should talk with his son. The boy thinks he just can't make it through college, but he really wants to. His father wants the boy to continue and become a professional man. His son will go back to college full of resolution for better studying, and he won't let the work get the best of him.
b) The boy is doing homework. He is a student at college. He is encountering a very difficult problem. Perhaps he has not been faced with anything as difficult as this problem. The boy will search for a solution. He wonders if he will succeed in solving this and future problems of college curriculum. He will probably solve this situation but become permanently baffled by other situations.

(The above anticipation is doubtful in nature, and according to the present scoring system would be scored AGa-.)

c) The older man has just told the younger one that he has a very important job he wants him to do. The younger man has had a very good scholastic record and the older man believes that he is the only student capable of doing this assignment. The younger fellow is wondering if he is capable of performing this task, and he realizes what the results will be if he fails. The older man knows that he is asking a great deal, but feels the student will come through 'O.K.' The student will have a great deal of trouble with this lesson, but he is very determined and will succeed.

(In the above story a doubtful anticipation is followed by a clearly negative one. In the next sentence, a positive anticipatory academic goal state appears, 'feels the student will come through O.K.' This story would be scored both AGa- and AGa+.)

d. Affective States.

1. Positive emotional concomitants of academic accomplishment (AG*).

a) A father is talking to his son. He is telling him that he is proud of him because he is doing so well in school. He wants his son to stay on the ball and keep getting good marks. He just knows his son will be a very successful business man. His son has just come home from college after pulling honors all through the year. They are both dreaming of what the son will be in the future. The son can just see himself as the President of the biggest publishing company in the U. S.

2. Negative emotional concomitants of academic failure (AG-).

a) This is the night before the big econ exam, and Johnny Jones is worried. He's got to get an A. He has been taking it easy all year and now wants to bring his
average up with a good grade. He is thinking what a damn fool he has been, and why didn't he study the months before. He must get an A or he will have to take the course over. He knows his father will give him the devil for not working harder.

(Note that the phrase 'Johnny Jones is worried' has a future reference and so would be scored AGa- rather than AG-.)

e. Press.

1. Nurturant Press (ANup).

a) An old experienced prof is giving a young green kid a little helpful advice on how to improve his class work. The student has been slow and has had a little trouble getting into the swing of things, and the prof has noticed it. The kid is thinking maybe the prof has some good ideas, and it may help him improve and maybe even impress him enough for a higher grade in his course. The student will take all the advice to heart and go back to class with the better study methods suggested by the prof.


a) A father, who is a writer, is talking to his son, who is in college. His son wants to be a writer like his father, but has recently had difficulty with most of his subjects at school, especially English. He hasn't been able to get good marks on the work he's done, and it doesn't seem as if he ever will. His father is a well-known writer who struggled to get where he is. He tells his son that he'll never be a writer, 'cause he's too much of a 'dumb-cluck.' The young man resents this, but is beginning to feel that his father is right. He feels inferior to his father, and has an emotional block and is never as successful as he might otherwise have been.

3. Personal Obstacles (ABp).

a) A boy is daydreaming. He is a student who knows he has to study. In the past he has had poor marks. Now he realizes he must study harder or else his schoolwork will just be a waste of time. He thinks of the last mark and what will happen if he doesn't improve. This fellow will really study and prove to himself he is not a failure but will make good.
4. **Environmental Obstacles (ABw).**

   a) Student is sitting at his desk worrying over his grades. He has had poor high school preparation for college, and as a result poor semester grades. He wishes he could settle down and make a go of his college without constant failing. He evidently will make a go of college after finding courses in which he is interested.

   (In this example the obstacle is scored ABw and not ABp, because it seems clear that the high school was to blame for the inadequate preparation and not the student.)

f. **Academic Achievement Thema.**

1. **Hope of Academic Success Thema (ASTh).**

   a) See example under (1) a. Competition with an academic standard of excellence. Story 1. This boy was asked to write a scientific thesis, etc., pg. 165.

   b) A young boy is daydreaming about the past wars in which doctors have participated. He is not sure of the course to follow; he is deciding whether or not to become a doctor. He is thinking about John Drake, the great surgeon of World War I, and his great feats in it. He was certainly a remarkable man. The boy will go to college and finally become a famous surgeon himself and in turn will be an incentive to the future doctors in college to work hard and be interested only in the welfare of mankind.

   (These stories illustrate the Hope of Academic Success Thema. No other interest is introduced.)

2. **Fear of Academic Failure Thema (AFTh).**

   a) The student seems to be perplexed with some problem and then finding no solution appears to daydream. The young student was asked a question about which he didn't know the answer, so he felt rather discouraged and disgusted. The student is wondering whether schoolwork is necessary 'stuff' or not. He hopes he were doing something else. He'll eventually flunk out of school, and never make much of his life.
AUTOBIOGRAPHY

Verne Arthur Walter, was born in Sandusky, Ohio, on June 12, 1922. I received my elementary school education at St. Mary's Parochial School and my secondary school education at Sandusky Junior and Senior High Schools. My undergraduate training was obtained at Bowling Green State University, Bowling Green, Ohio, from which I was graduated in General Psychology, receiving a Bachelor of Arts degree in 1951. I also received the Master of Arts degree from Bowling Green State University in 1952. While in residence at Bowling Green State University, I served in the capacity of a graduate assistant in their Psychology Clinic. I was appointed as an Instructor of Psychology at Bowling Green State University and taught General and Adolescent Psychology for the term 1952-53. In 1953 I entered The Ohio State University, the Department of Psychology, where I served for one year as a teaching assistant in the How-to-study program and for one year as a counselor assistant at the University Counseling and Testing Center. I was also a member of the Veterans Administration training program in Counseling Psychology for a period of one year while completing the requirements for the degree of Doctor of Philosophy.