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DIMENSIONS OF THE CHARACTERISTICS RELATED TO THE HIGH- AND LOW-ACHIEVEMENT OF A SELECTED GROUP OF NEGRO COLLEGE STUDENTS

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CHAPTER I

INTRODUCTION

The world crisis has created in America a profound concern over the identification and utilization of the total resources of all youth. Statistical reports, manpower councils, and talent searches have revealed a need for trained, alert leaders whose potentialities have been developed to the fullest extent. Their findings also point up a failure of our educational systems to meet adequately this need. The National Manpower Council emphasizes the importance of full development of America's human resource in its Policy for Skilled Manpower. One statement asserts:

> "Our future progress and strength depend upon a conscious and deliberate concern with our manpower resources. Recognition that our most precious single resource consists of the skills, capacities, and creativeness of our people is not enough. For the sake of contributing to the greater well being of each individual and strengthening the nation as a whole, it is also necessary for us to assure the further development of our manpower resources to their more effective utilization. . . ." (47, p. 19)

The Educational Policies Commission of the National Education Association is in close agreement with this goal. In its 1956 report there is this declaration:

> "In America today more than a census of individuals is required. Ideally, the assessment of manpower resources would call for an inventory of the levels of native capacity, of personal motivation, and of developed skill in the nation's population.
>
> . . . In the population are all the types of talent on which modern society rests. While much of the talent in America has been educated to a considerable degree, there is in the reservoir a great wealth of ability not fully trained or not fully used. The cultivation of human talents, and particularly of those abilities most urgently needed by society, is an imperative responsibility of today." (21)

In spite of this recognition of the need for optimum development of the abilities of every child, attrition in our school system remains high. The 1954 Report of the Commission on Human Resources and Advanced Training disclosed that of those who ranked in the top fifth of their classes as high school graduates, only fifty-three per cent continued their education in college (68). Many of those who do matriculate in institutions of higher learning drop out before completing their college courses, and the majority never pursue their education to the fullest extent of their potential promise. This loss of intellectual resources has become a crucial problem for our nation. Twentieth century technological advances have plummeted us into an era of automation and now, as never before, superior talents are needed so that America may keep pace with the scientific developments of the world. Institutions of learning must concern themselves with the discovery of intellectual potential and with the provision of such academic experiences as will motivate self-realization in those individuals who possess it. Of particular importance are the bright and the academically gifted children. For these talented youth must furnish the creativity and vision necessary for the solution of those problems which will arise in the world of tomorrow. One writer very aptly affirms:

> "It is important to give gifted children the education they need because society needs them badly. Our economy needs them, and we must have them for national security. They are our most valuable human resource because they maintain our culture and create the advances in all fields. Future generations depend on them.
>
> But they need us too. They need help and guidance. They must be discovered and carefully nurtured. If they are lost, democracy suffers. The supply is low and precious. We must invest in talent because the return to society is ten times the cost." (45, pp. 13-14)

Since the cruciality of the need for complete utilization of resources is being emphasized by the intellectual, political, and economic leaders of our country, educators must concern themselves with how the demands can best be met.

THE PROBLEM

The problem of this study is (1) to determine whether there are significant differences between those non-intellectual characteristics of personality needs, personality adjustment, vocational interests, and study habits and attitudes which are possessed by the high- and low-achieving individuals of a selected group of Negro college students; (2) to ascertain the extent to which there are sex variations in the non-intellectual characteristics of the two groups; and (3) to reveal those interactions between the achievement, sex, and test variables which might affect the dimensions of the non-intellectual characteristics of the high- and low-achieving groups.

Justification of the Problem

Utilization of intellectual potential does not relate solely to provisions for those who are identified with the near-genius or genius groups. There are many now-classified as "superior" and "bright" who,

if properly nurtured, will render in later years invaluable services in varied fields. Some of these, and others, possess far more ability than can be determined through the use of the presently-developed measuring instruments. Mediocrity of environmental experiences, low socio-economic status, and indifferent attitudes toward education may result in such poor educational motivation that children from these backgrounds appear intellectually inferior. Richard L. Plaut, in Blue Print for Talent Searching, refers to Negroes, Puerto Ricans, Mexican-Americans, rural and migratory workers, and American Indians of the lower socio-economic levels as being "the most overlooked among the undereducated." (50) All of these groups should be provided with educational opportunity and challenge. In The Negro Potential, Eli Ginzberg shows statistically that there is a lag between the potential number of high school graduates and the number who actually complete their courses (30). Utilization of the members of these less fortunate groups would greatly diminish this gap.

Many of those who go on to college show a cultural lag between their potential and their achievement. This is sometimes due to the lack of the drive to succeed and to a low level of aspiration. Whatever may be the cause, this discrepancy between ability and performance could result not only in an ultimate loss of leadership, but also in the psychological maladjustment of a large number of future citizens. An analysis of the grades of college students gives factual evidence which proves that a high percentage of them earn grades below the achievement level predicted by their ability test scores and teachers' ratings. It is this failure of students to reach their complete intellectual growth which is the concern of this investigation. For it is the responsibility of the

educational system to seek to alleviate whatever conditions prevent their reaching an optimum development. As Ginzberg states: "Only when the potential with which men and women are born is allowed to develop fully can a society have both a sound foundation for economic progress and individual contentment (30, p. 10)."

Background of the Problem

The setting is the Alabama State College at Montgomery, where more than an average number of underachieving pupils may be found. Grade reports and analyses show that many fail to reach the levels predicted by their high school grades and scholastic ability scores. A low achievement pattern is often established during the freshman year and followed throughout the college career. The writer developed an interest in this problem while analyzing the achievement records of the 1957-58 freshman class of the college. Analysis of the 1958-59 freshman class grades gave similar results. There was much deviation from the patterns which had been indicated by the high school transcripts and the entrance tests scores.

Questions were raised about this in the reports which were made to the faculty. What was the basis of this failure to achieve? Why did so many students with ability fall below others who had achieved beyond their measured potential? What accounted for the differences in the grades of the low-achieving group and those whose grades were commensurate with their predictive levels? What, if any, were the factors which caused these differences? Do achievers possess characteristics which are lacking in the underachievers? The research problem of this investigation has been the outgrowth of these unresolved issues. It is an approach which, through the consideration of some characteristics of both high-achieving and low-achieving pupils, may uncover some leads for the

motivation of the underachievers towards a more adequate achievement level.

Significance of the Problem

It is now recognized that personality factors and problems of adjustment may have great influence on achievement. In recent years, there have been many attempts to uncover, through scientific research, some of these factors and the degree to which they may motivate academic success or failure. There have, however, been few investigations made on the influence of non-intellectual traits on the achievement of Negro students at the college level as will be shown in Chapter II which reviews related literature. Nevertheless, there are motivation, adjustment, and aspiration problems which operate within this group of students, and there is the probability that much of their underachievement stems from personality factors.

Some of this intellectual maladjustment may also be due indirectly to a lack of those cultural conditions which build within an individual the drive and desire to achieve and to excel. Kardiner and Ovesy (40) suggest that the Negro, because of his cultural setting, must make an adaptation which affects his self-esteem and frequently causes him to become apathetic. Karon's study of Negro personality (41) also found evidence to prove that cultural deprivation can motivate certain types of personality functions, or malfunctions. There is certainly a need for research which might help educators to deal with those academic problems of Negro youth which are related to non-intellectual factors. Noble emphasizes this psychological approach in college education for Negroes. She states:

> ". . . The total development of the student's abilities and capacities is, in the long run, the most important outcome.

> Included would be the student's ability and capacity to understand himself, accept himself, and realize self-fulfillment. Education from this point of view would deal with the emotional aspect of learning as well as the intellectual. It would be concerned with how the student feels about himself and draws upon his resources for growth. It would care about how he feels about others and relates to them. Furthermore there would be decidedly conscious efforts to provide ego-building experiences that contribute toward feelings of personal adequacy, as well as scholarly attainments.
>
> The challenge for the Negro college lies in its ability to provide such an education for its students. Education if it is to count for something that is real and valuable in the lives of students must emphasize the psychological dimensions as well as the sociological." (48, p. 403)

This type of education can only be supplied when there is more knowledge about the characteristics of the Negro student. This investigation seeks to gather such knowledge.

The present study has significance for several reasons:

1. It furnishes some information about the characteristics of two groups of Negro students enrolled in a particular college. Other studies which seek to extend research in this area may be developed, at this and other institutions, as a result of interest in - or exceptions to - the findings of this investigation.

2. The findings and recommendations of this study will furnish the administrative heads and the personnel department of the Alabama State College, Montgomery, with detailed analyses of the characteristics of a sample of its students. This information could make these officials more intelligent as to the personalities and the achievement patterns of these particular groups.

3. The findings might be of further value in the design of other internal studies of the college's student body.

4. Implications and suggestions for a more effective college counselling program, at Alabama State College, might be drawn from the findings of this investigation.

Purposes of the Study

This study will examine certain non-intellectual characteristics of low- and high-achieving groups of Freshman College Students, in order to determine whether there exist measurable differences between the two groups. The investigation also seeks to determine whether there are sex differences in the personality characteristics of the low- and high-achieving students.

HYPOTHESES

This study was developed on the general assumption that: There are no significant differences in the dimensions of the personality characteristics of the high- and low-achieving students in the group of 227 Alabama State College freshmen comprising the sample population which was used.

Specific hypotheses are:

1. There will be no significant differences between high- and low-achieving students on the composite scores derived from the fifteen variables of the Edwards Personal Preference Schedule.

2. There will be no significant differences between the high- and low-achieving groups on the composite scores derived from the thirteen variables of the Minnesota Multiphasic Personality Index.

3. There will be no significant differences between the high- and low-achieving groups on the composite scores derived from the ten variables of the Kuder Preference Record.

4. There will be no significant differences between the high- and low-achieving groups on the scores made on the Brown-Holtzman Survey of Study Habits and Attitudes.

5. There will be no significant differences between the high- and low-achieving groups on the results of the Edwards Personal Preference Schedule; Minnesota Multiphasic Personality Inventory; Kuder Preference Record; and Brown-Holtzman Survey of Study Habits and Attitudes with respect to sex variations.

6. There will be no significant interactions between any combination of these variables: (A) Achievement, (B) Tests, and (C) Sex.

DEFINITION OF TERMS

Low-Achieving Student will refer to any subject whose T-score for the average of the three normalized achievement test scores falls within the lower quartile of the total distribution for the first sample (Upper third of the 1959-60 Freshman Class.)

High-Achieving Student will refer to any subject whose T-score for the average of the three normalized achievement test scores falls within the upper quartile of the total distribution for the first sample.

Non-Intellectual Characteristics will indicate those traits or variables which are measured by the EPPS (Edwards Personal Preference Schedule), the MMPI (Minnesota Multiphasic Personality Inventory), the KPR (Kuder Preference Record) and the SSHA (Brown-Holtzman Survey of Study Habits and Attitudes).

Scholastic Aptitude will be indicated by the total scores made on the SCAT (School and College Ability Test).

ORGANIZATION OF THE STUDY

The report of this investigation covers five chapters and a reference and appendix section. Chapter One has given the background of the study, stated and justified the problem, presented the hypothetical assumptions, and defined the major terms. The second chapter is devoted

to a survey of selected studies which are related to the area of the present investigation. Chapter Three explains the procedures and the design of the study and describes the instruments and the methods used in the collection of the experimental data. Chapter Four presents the data which were collected, and interprets the findings through tables, discussion, and comparative statistical analyses. The summary of the study, the conclusions, and the recommendations are given in Chapter Five. A list of references and those tables germane to the investigation which are not presented in the main body of the report are found in the reference and appendix sections.

CHAPTER II

REVIEW OF SELECTED STUDIES

It has long been accepted as fact that though ability is a major element in scholastic achievement, it is not the sole motivating factor. During the first four decades of this century, numerous investigations have been made to determine the relation of other factors to achievement, and, sometimes, to underachievement. Many of the earlier studies have been descriptive, giving a survey of status and placing minimum emphasis on the implications of the findings. Later studies have relied in the main on a more scientific approach to the exploration and solution of their stated problems by using hypothetical assumptions and statistical interpretations.

In this review of the literature only those studies are included which have dealt with the non-intellectual factors explored by the present investigation and their relation to achievement. More detailed discussion has been allotted to those studies of Negro subjects and to that research which the writer considered most pertinent to this study. Brief summations are made of the other literature.

Earlier Studies: 1900 - 1940

One of the earlier approaches which was made by George C. Brandenburg (6) at Purdue University sought to determine the relationship of

personality to school achievement. Twenty-nine senior engineering students at the institution were rated by their classmates upon twenty-three personality traits. Results of Army Alpha test scores, to measure potential, and college grades, to establish achievement, were also examined. The conclusions showed that there was slightly closer relationship between the student's personality and his grades than was found to exist between his measured intelligence and his grades.

Three researchists of the 1930's dealt with personality factors as they related to scholastic success. In 1933, Taylor (59) made an investigation of the scholastic significance of certain personality traits, using as his subjects 122 freshmen women at the University of Oregon. He found that, in spite of negligible correlation with each other and with general scholastic ability test scores, each set of personality ratings showed a moderately high correlation with college scholarship.

Reported during the same year was Ross Stagner's study of the relation of personality to academic aptitude and achievement (55). This investigation gathered data through the use of the following "objective" tests of personality: Pressey X-O (form A); Allport A - S Reaction Study; Laird C_2 Inventory; Neymann-Kohlstedt Test for Introversion-Extraversion; Thurstone Neurotic Inventory; Moss Social Intelligence Test; the investigator's own ABC Questionnaire, unstandardized; and the Bernreuter Personality Inventory from which most of the study data were taken. Several populations were used in the administration of the different tests, with students being included from upper and lower class levels at the University of Wisconsin and from Gustavus Adolphus College. Two hundred fifty freshmen men were used as the sample population. Groups of "achievers" and "non-achievers" were set up on the basis of the ratio of achievement

to aptitude, as obtained by correlation. The study showed that personality influences achievement through affecting the degree to which use is made of the individual's potentialities. Though low linear relationships were found between intelligence, achievement, and personality, Stagner justified this as an effect of the "inherent nature of the relationship." In his summary and as a result of his statistical findings, he makes the statements that (a) "Extreme personality trends seem to counterbalance advantages in aptitude, making for equal achievement in opposed groups. High emotionality and high self-sufficiency lead to lower achievement than would be predicted from intelligence scores" and that (b) "personality factors have marked influence on the correlation of aptitude and achievement." A very valuable portion of Stagner's study is the extensive bibliography which has been documented to show the statistical relationships found by each quoted investigator.

Bayliss (2) used the individual interview approach in finding the personality or emotional difficulties characteristic of first year women students at the University of Wisconsin who had made unsatisfactory scholastic attainment. She found that poor study habits and attitudes, emotional instability, lack of definite purpose, and immaturity were frequently present in the subjects interviewed.

The relation to college grades of some factors other than intelligence was the problem considered by Dr. Daniel Harris, as reported in the July issue of the 1931 volume of the Archives of Psychology. Harris had previously become concerned about the low correlation between intelligence test scores and grades, as evidenced by the fact that "People of equal ability often do very unequal work; bright students often do poorly; and

the highest grades are often received by those of no more than ordinary intelligence." This study (33) sought to analyze the effect of other factors than ability on college grades. Three hundred thirty subjects, drawn from the class entering the City College of New York in February of 1929, were selected for homogeneous backgrounds of race and culture. Data were secured on physical characteristics, Army Alpha score, Martson's Introversion-Extraversion Blank, Payne's Inferiority Test, average of first semester grades, and two questionnaires which covered, among other items, interests, backgrounds, religious beliefs, and extra-curricular activities. After scores were compared and analyzed in detail, it was found that thirteen factors were associated with low scholastic achievement and thirteen were unrelated to it. Among the former were certain factors of negative self-feeling, non-conformity, superficial study habits, and extraversion.

One section of Dr. Harris's study is devoted to a summary of the studies which had been made in the problem area prior to 1930. In the "Personality and Character Traits" section (33, pp. 7-8), more than thirty previous investigations are mentioned. Though some of these varied in their conclusions and in their findings, seventeen are cited as proof of the relationship between such personality and character traits as persistence, aggressiveness, conscientiousness, co-operativeness, force of personality, leadership, resistance to suggestibility, school attitude, - and school success as shown by grades.

Harris continues the summary of literature which was a part of the 1931 study report in a Review (32) which appeared in the Psychological Bulletin, 1940. The research of the years of 1930 through 1937 is included. "Personality, Interests, Attitudes" and "Study Habits and Methods" are the

sub-titles of two segments of this summary of factors affecting college grades. As reported by Dr. Harris, diverse conclusions are found by the investigators in each of these areas, but, in many instances, relationships are found between achievement and certain personality factors and study habits.

Another comprehensive summation of the literature in the field of academic achievement and those factors which influence it was made by S. Jean Wolf (67). Forty-two investigations are summarized, twenty-seven of which deal with subjects of the college age level. Non-standardized Rating Scales were used most frequently in the collection of data. Among the standard measures used were the Downey Will Temperament Profile, Woodworth's Psycho-Neurotic Inventory, Laird's Personal Inventory Schedule (B_2 and C_2), Payne's Inferiority Test, Thurstone's Neurotic Inventory, and Thurstone's Personality Schedule. Some of the investigators found fair-sized correlations between personality and scholarship, while others found no measurable evidence of relationship. Emotional disability or instability was listed frequently as a factor in failure, while motivation, caution, and perseverance were found to be related to scholastic success.

The earlier studies, though often unscientific in approach and in many instances employing subjective, unstandardized measures, served the purpose of establishing a need for more thorough and controlled investigations in the general area of "Factors, Other Than Ability, Relating to Scholastic Success." From these early research reports, came leads and clues, weaknesses, and challenges which motivated later investigators towards more scientific psychometric and statistical methods.

Some Later Studies

The research literature of the last two decades has included many studies which seek to determine the effect of non-intellectual factors on the achievement of gifted or bright individuals. In 1949, Owens and Johnson (49) sought to identify, from responses to standardized personality inventories, some of the distinctive characteristics and modes of adjustment of a sample of collegiate underachievers. One hundred sixty-four male freshmen in the Engineering Department at Iowa State College were the subjects. On the basis of their winter quarter test results, they were placed into three groups: 50, designated underachievers; sixty, designated normal achievers; and fifty-four, designated overachievers. A three hundred item group form of Minnesota Multiphasic Personality Inventory, the Minnesota Personality Scale, and a personal check list were administered to all of the groups. Item analysis and statistical procedures revealed that there were certain measurable personality traits peculiar to these underachievers, among which were social extraversion and a slight neurotic-psychotic tendency.

Freshmen male students were also used by McQuary in his attempt to find the relationships between non-intellectual characteristics and academic achievement (44). Data were collected on twenty-three stanine-normalized variables for nearly 200 first semester freshmen who had sought the services of the Student Counselling Center during their first semester at the University. The students had been classified as Over- or Under-Achievers on the basis of the correspondence ratio of their grade point averages to their American Council of Education Psychological Examination

scores. The variables, other than the ability test areas, included: Speed of Reading; English; Vocabulary, as measured by the Co-operative Tests; Social Introversion and Extraversion, as measured by Minnesota Multiphasic Personality Inventory; High School Percentile Ranks; and Occupational Level of the Fathers. The relation of the variables to each other and to the earned grade points was determined through correlation and factor analysis. Academic Performance, Prediction, Social-Class Intelligence, Participating Urban Scholar, Social Extroversion, Age, Academic and Financial Security and Introvertive Reader were the seven factors which were extracted and identified. The two hypotheses tested and accepted held (1) that achievement in college is significantly related to certain non-intellectual variables and (2) that non-intellectual variables can be grouped into several factors.

Morgan began his investigation (46) with the conviction that "studies of non-intellectual factors and achievement have not yielded clearly consistent results" and a belief that these inconsistencies "may be due to variety of measuring instruments, different populations tested and varying definitions used in establishing achiever and non-achiever groups." Again, male students - 132 - were the subjects who were selected on the basis of American Council of Education Psychological Examination scores and distributed into three groups on the basis of honor point ratios obtained during the freshman year. The upper and lower groups were designated as "Achievers" and "Non-Achievers," respectively. Psychometric comparisons of the group were made on the Strong Vocational Interest Blank, the Minnesota Multiphasic Inventory, the Thematic Apperception Test, and a series of semi-structured questions. Statistical analyses, profile

interpretations, and judges' ratings were used to interpret the results. The study indicated several non-intellectual factors of personality variables which were related to the academic achievement of high-ability college students. These were listed as (1) Maturity and Seriousness; (2) Awareness of and Concern for Others; (3) Sense of Responsibility; (4) Dominance, Persuasiveness, and Self-Confidence; and Motivation or Need to Achieve.

A comparison of the characteristics of academically most and least successful college freshmen was made by Volle (65). His problem was concerned with the characteristic differences of freshmen who had attained the most and the least during their first semester at a Mid-Western college. He further sought to clarify success and failure by noting differences in (1) family background, (2) social and leisure-time experiences, (3) academic aptitudes, (4) study methods and learning conditions, (5) physical and mental health, and (6) interest or motivational patterns. Grade point averages were used to select the 120 subjects who were classified into four groups of thirty each as: "Superior Women," "Superior Men," "Failing Women," "Failing Men." Data for each of these students were derived from questionnaire-personal interview; college entrance test scores made on the Otis Intelligence Test, ACE Psychological Test, Cooperative Tests of History, Science, Mathematics, and English Mechanics, and the Nelson-Denny Reading Test; Strong Vocational Interest Blank; Minnesota Multiphasic Personality Inventory; personality ratings; record of calls at the infirmary; and the registrar's records. The greatest differences between groups were found in the areas of academic aptitude and study methods and learning conditions, while the smallest differences existed in the area of family background.

In physical and mental health, superior men had much higher femininity scores on the MMPI, and failing women were higher on the depression scale. Volle concluded that:

(1) "No simple prescription can be established for the identification of academic success or failure.

(2) "Measures of academic aptitude offer the greatest promise in the prediction of academic success or failure.

(3) "The greatest non-intellectual differences noted in the study were in study methods and learning conditions, and

(4) "Many unaccounted-for causes of academic inefficiency still remain to be identified, especially in the non-intellectual areas."

William Levi Cash stated that the purpose of his investigation (16) was "to determine the extent of the relationship between selected personal characteristics and academic achievement in theological studies." Such personal characteristics as scholastic aptitude as established by Ohio Psychological Test; marital, resident and employment status; length of residence; class in the seminary; socio-economic background; and personality traits, as revealed by Bernreuter's Personality Inventory were gathered for 134 Oberlin Graduate School of Theology students for a three year period. Grade-point ratios were used as criteria of academic achievement. The Pearson "r," the t-test of difference between means, the F-test, and Chi Square were the statistical measures of the differences between the groups. Among other findings, there appeared a significant relation between self-sufficiency and length of seminary attendance and personal data. There were also relationships between neurotic tendency and scholastic aptitude, and between aptitude and grade point ratios.

Three studies (36, 61, 10) published during 1956, dealt with non-intellectual characteristics and achievement. The Minnesota Multiphasic

Personality Inventory was one of the measures used in each of these investigations. In Hewer's study (36) the research was concerned with the comparison, by various methods, of the scores made on tests by a group of successful and unsuccessful medical students in order to determine whether any of the tests, including Strong Vocational Interest Blank and MMPI, can be used to predict success in medical school. The sample included men who had successfully completed a segment of their medical work, and others who had dropped out because of scholastic failure. Statistical analysis of the data and interpretation of the profiles and judges' groupings of the SVIB and MMPI scores showed that the unsuccessful medical students had a significantly higher score on the Lie Scale of MMPI, which Hewer felt might suggest either defensiveness of response or low psychological maturity. There was also a suggestion that the general personality organization, as measured by MMPI, might differ in successful and unsuccessful students. Thompson (61) also found through the analysis of Strong's VIB and MMPI results that "Men with deviate MMPI profiles tend not to achieve as well scholastically as men with 'normal' profiles."

The third study, by Burgess (10), dealt with over- and under-achieving students and investigated the hypothesis that students who over-achieve in a college situation have common personality factors which differentiate them from college students who under-achieve. The population of the study consisted of 492 engineering students for whom there had been derived a predictive index based on high school rank and academic aptitude in mathematics. Two samples of twenty each were selected to represent over- and under-achieving students as based on the relation of their college performance to this predictive index. Each student was then administered the Rorschach, certain of the Thematic Apperception Test cards, the MMPI, Rosenzweig Picture Frustration Study, Strong VIB for Men, and

the College Inventory of Academic Adjustment. The Bernreuter Personality Inventory results which were on file were also used. There were no significant differences obtained for any of the clinical or validating scales of the MMPI though there was the suggestion of a tendency for over-achievers to score higher on the Hypochondriasis Scale and for under-achievers to score higher on the Masculinity-Femininity Scale. Two of Burgess's conclusions follow:

1. "Over-achievers show certain personality factors as a group, and these differentiate them from a group of under-achievers. They are less labile in their affective readiness, tend towards more constriction, and are more inhibited in emotional response to pleasurable aspects of the environment. Intellectual adaptivity is greater, the approach to problems is more cautious and concrete, and intellectual control of emotional reactions in the face of strong outer stimulation is more affective. Need for achievement and improvement of the self or status is greater, and they are more motivated for college study, enjoy it more, and expect to get more from it. They are more efficient in the use of their time and tend to be better adjusted to the college situations.

2. "Under-achievers are less intellectually adaptive, overgeneralize and over-extend the self, and show less intellectual control and repression of emotional reactivity. They over-react to environmental circumstances, and in general show easy, labile affectivity. Establishment of rapport in social situations is easier, but they are more dependent in their attitudes towards others. Motivation for academic achievement is weak; they tend not to enjoy the school situation, and to be unable to see the value of an education."

In order to determine if there are identifiable factors related to over-achievement and under-achievement in college achievement and aptitude, Boyce (4) compared two groups of 49 each on interests, personality characteristics, home and parental background, activity participation, health, reading skills, and vocational plans. The results of the study substantiated the hypothesis that there were significant differences in that population on eleven of the variables which were analyzed.

Seventy-four over- and sixty-four under-achieving students at the University of Arkansas, classified on the basis of the ratio of cumulative grade point averages to T-scores of ACE Psychological Test raw scores, were studied by Diener (20) to determine if the groups possessed significantly different characteristics in certain areas. In addition to such routine factors as scholastic ability, extra-curricular activities, part-time work, and residential locale, the subjects were administered the Brown-Holtzman Survey of Study Habits and Attitudes, the Kuder Vocational Preference Record, and the Edwards Personal Preference Schedule. Analyses of these test results revealed few significant differences, other than in "artistic interest," as measured by the Kuder, and "order," as measured by Edwards PPS. Better study habits characterized the over-achieving males. The author recommended (1) that additional research be pursued in order to determine whether over- and under-achievement are stabilized factors or the result of random fluctuation and (2) a possible re-defining of over-achievement and under-achievement in terms of new investigative constructs based on sociological or status concepts.

A study which used only women subjects was made by Nancy Katherine Knaak (42). She proposed to investigate those characteristics common to both the academically successful and unsuccessful freshmen women at Northwestern University and those characteristics which distinguished the former group from the latter. The subjects were limited to women in an effort to examine critically certain earlier generalizations, as well as to develop a piece of research which compared women with women. Thirty-five Honors Students whose minimum grade average was A-minus comprised the successful group which was compared with the Unsuccessful Students - those who had been placed on academic probation at the University.

Comparisons were made on many factors such as vocational preferences, test scores, temperament, and questionnaire items. Among the differences found were some obtained from the Guilford-Zimmerman Temperament Survey, in which the women of the Probation Group received significantly higher scores than did Honors Students in the area of "Sociability," while the latter group scored higher in the areas of "Seriousness" and "Reflectiveness."

Horrall conducted an experimental study (38) through which she attempted to gain an understanding of the performances and personalities of brilliant college students, in terms of their differences from college students of average college ability. The experimental group was selected from freshmen whose ACE Psychological Test scores were 1.5 sigmas or more above the mean. These subjects were matched with a control group, taken from the middle of the distribution, on the basis of sex, school attendance at Purdue University, veteran or non-veteran status, and fraternity membership. Sub-groups were established on the basis of academic achievement to determine whether those who were academically superior possessed different personality dynamics from those who were academically poor. A general information blank was filled by all of the subjects, and the orientation test grades in English, Mathematics, and Physical Sciences were used. Ninety-four matched pairs were given a Group Rorschach Test and the Clark Group Thematic Apperception Test to measure adjustment and the Spencer Experience Appraisal to get an estimate of the harmony or lack of harmony in the family relationships and homes of the subjects. Since the writer was interested in whether replication of the experiment would give a difference in the same direction as that of her present study, tests of differences were made with this interest kept in mind. After running

comprehensive tests on the groups and sub-groups, Horrall found that, among other facts, (1) On the Clark Group Thematic Apperception Test the experimental subjects were significantly better off than the control group, in that they had fewer total "needs," fewer "needs" for achievement and recognition, were better adjusted, and possessed better "effect of environment on organism," and better "reaction of organism to the environment." (2) The experimental subjects showed fewer conflicts about personal characteristics and about school performance. (3) No significant difference was found on the group Rorschach Records. (4) On the basis of the TAT the low-achieving, experimental group showed poorer over-all adjustment, showed more conflicts on the Experience Appraisal, and showed poorer form perception on the Rorschach. The high-achieving subjects displayed more anxiety. (5) There were also differences found between the two sub-groups of the control subjects. As a result of the continued experiment and the comprehensive findings of the study, Horrall concluded that:

> ". . . academic under-achievement for brilliant students is a symptom of deep-seated personality problems. Also over-striving on the part of students of average ability who get high marks is clearly indicated and is associated with personality problems on their part.
>
> . . . . . .
>
> "In order of excellence of adjustment, it seems apparent in this study that sub-groups line up as follows:
>
> 1. Excellent adjustment: High-achieving brilliant students.
> 2. Fair adjustment: Low-achieving students of average ability.
> 3. Poor adjustment: High-achieving students of average ability.
> 4. Very poor adjustment: Low-achieving brilliant students."

Pertinent and workable recommendations were set forth for use with students who possess the characteristics of the subjects of this experiment.

Another research study was that made by Shaw and Brown (53) who compared under-achieving bright students with a control group in order to discover some of the distinguishing characteristics of high ability students who did not achieve academically on a level commensurate with their ability. The two groups were composed of freshmen; and personality measures administered to them included Allport-Vernon-Lindsey Study of Values, Bell Adjustment Inventory, and Bell Preference Inventory. No significant differences were found between the two groups on the four categories of the Bell Adjustment Inventory; nor were there significant differences on the Study of Values scales. Analytic interpretation of differences indicated that the under-achievers of this study were characterized by an attitude of hostility or hyper-criticalness with respect to people, which might not necessarily be shown in overt behavior. The authors state:

> "It is interesting to speculate upon the meanings of the findings, particularly as they have reference to further research. One of the first hypotheses which seems reasonable is that under-achievement on the part of the bright students is not a surface phenomenon easily modifiable, but rather is related to the basic personality matrix of the individual. Second, it seems reasonable to hypothesize that what appears on the surface as "under-achievement" is not actually the case. Rather, the individual is learning, but his high school teachers and college instructors do not sense or measure this achievement. Third, this apparent under-achievement may be related to certain specific personality characteristics. One of these characteristics may be a hostility toward others, possibly toward authority in particular. . . . The fourth hypothesis would be that under-achievement is closely related to the family and social milieu in which the individual has grown. . . ."

Two studies which dealt with the influence of personality traits or needs on academic success were made by Jensen (39) and by Gebhart and Hoyt (29). Both used students in their first year of attendance at the respective institutions of learning. The first study was undertaken in

an attempt to gain a better understanding of the influence which personality traits have on non-achievement and low scholastic ability, while the second had as its major purpose the investigation of the relationships of the scores made on the Edwards Personal Preference Schedule to under- and over-achievement in the divisional schools of the university. The Jensen study was designed so that statistical analysis could be used to compare the personality traits of unachieving students of low scholastic ability with three other classified groups, the four groups having been set up on the basis of grade point average relation to a predictive multiple regression equation which used ACE Psychological Examination scores and high school grade point averages as the predictive variables. A shortened version of the MMPI was used, and the results showed that the most obvious trend was for non-achievers of low scholastic ability consistently to obtain higher scale scores than achieving students of high scholastic ability. Gebhart and Hoyt classified their groups as to achievement (under or over), ability (high, average, or low), and school at Kansas State (Engineering or Arts or Sciences). A factorial design was used to reach the conclusions, two of which established that (1) Over-achievers scored significantly higher than under-achievers on the "Achievement," "Order," "Intraception," and "Consistency," scales of Edwards PPS and significantly lower on the "Nurturance," "Affiliation," and "Change" scales and that (2) Workable hypotheses regarding the need patterns of under- and over-achievers could be developed.

Coleman LaVon Raley proposed to isolate the non-intellectual personality traits of the high academic achiever at the college level (51). He sought to do this through the use of two groups that were matched for sex, academic classification, and mental ability. Group I consisted of high

academic achievers while Group II included the moderate academic achievers, each group being selected in terms of the grade point averages which had been earned during their college attendance. Non-intellectual personality traits were measured through the variables of the Edwards Personal Preference Schedule; the Allport-Vernon-Lindzey Study of Values; and Interest Maturity, Occupational Level, Specialization Level and Masculinity-Femininity as measured by the Strong Vocational Interest Blank for Men. After thorough analysis of all of the results, Raley concluded that

> "In light of the above findings it seems unlikely that high achievers at the college level can be characterized as a group with the measures used in this study. . . ."

He also stated that certain of his findings suggested that there "may be more differences in the non-intellectual personality characteristics of students who achieve at the same level, although they differ significantly in academic ability, than there are between students who are matched for academic ability but who achieve at different levels."

One hundred thirty-five full time upper class students in the College of Business Administration at the University of Texas were the subjects Bunin used in his study (9). He was looking for significant differences among groups varying in academic performances when ability was similar, among groups varying in ability when academic performance was similar, and among groups varying in both academic performance and ability. Grade point averages in commercial core courses were used to measure achievement; ability was measured by the American Council of Education Psychological Examination, and personality need differences were measured by the Edwards PPS. The need differences were investigated, and profile characteristics were determined for each of the groups. The results of these analyses showed, among other things, that significant differences in manifest needs

were found among groups defined by levels of performance, among groups defined by levels of ability, and among groups defined by levels of performance and ability. It was also shown that those groups defined as over-achievers, under-achievers, and poor achievers had significant differences in manifest needs. The investigator stated that the study results suggested that the student's functioning personality must be taken into account when attempting to evaluate ability and performance. He further said that the over-all classification of students into performance level groups does not adequately consider the personality differences among the groups.

The later studies of the years between 1949 and 1960 reveal more adequate and objective analyses, logically evolved hypothetical assumption, and designs which make an attempt to ferret out the many facets of the personality or non-intellectual characteristics of the subjects with whom the investigators have been concerned.

Studies with Negro Subjects

There has been meager research with Negro subjects on the relation of non-intellectual factors to academic achievement. Some studies have simply included this area as a part of their investigations, and the treatment has, in these instances, been somewhat general in its scope. Of the seven investigations considered in this section of the review of literature, two are historically significant, three discovered related implications, and two were actually designed to explore the area of academic achievement.

Two studies made by Ambrose Caliver in the 1930's used, for that period of time, a new approach to personnel research as it related to Negro college students. They mark the recognition of the importance of

other factors than ability in influencing and motivating college adjustment and scholastic success. The first investigation (15) dealt with 450 subjects who were entering students at Fisk University, Tennessee, for the years of 1926, 1927, and 1928. The problem sought to analyze the social, economic, and intellectual backgrounds of these Negro college students in relation to their subsequent academic progress and also in relation to certain other activities and interests of their college careers. Specifically, Dr. Caliver sought to determine the importance of a knowledge of those background factors operative in students' lives which motivate their scholastic progress. Data were gathered through questionnaires, test scores, application blanks, transcripts, and cumulative record cards. Results were analyzed, both statistically and descriptively. Final evidence proved that the social backgrounds were reflected in the students' equipment at entrance, and that certain personal background factors seemed to have a definite influence on the college achievement of the subjects of the study.

Caliver's second study (14) was a cross-sectional investigation of 1880 Negro college freshmen drawn from colleges located in almost every state in the Union. This national survey of the social, economic, cultural, academic, and intellectual backgrounds of Negro college students was made because of the realization that more objective and comparable facts about Negro students - their nature, characteristics, achievements, interests, and ambitions - were needed, if these students were to profit from their training. College test scores, questionnaires, and blanks were analyzed for each of the subjects and conclusions drawn on the basis of these analyses. Among his findings Caliver listed this statement: "Failures

of students who have superior ability show either a lack of interest due to maladjustment, ill adaptation of abilities to task, or failure to work up to the level of intelligence."

Augustus C. Blanks (3) made what he states was "the first comprehensive attempt to ascertain the nature and extent of factors which tend to differentiate between mentally bright and mentally dull Negro high school seniors in the South." Four hundred six subjects were drawn from five public schools in Jefferson County, Alabama, during the school term of 1953-54. They were categorized as bright if they fell one standard deviation or more above the mean of the group on the SRA Verbal or Non-Verbal Tests, or as dull if they fell one standard deviation below the mean. Blanks hypothesized that no statistically significant differences would be found to exist between these two groups in regards to their background, personality, interest, school achievement, cumulative grade-point averages, and ambitions. Co-operative General Achievement, English, and Reading Tests were administered to the subjects. They were also given the Heston Personality Adjustment Inventory, as well as a questionnaire to determine backgrounds, interests, and ambitions. Analysis of the data proved, among other findings, that there were no differences existent between such personality traits as home satisfaction, personal relation, confidence, emotional stability, and sociability. There was, however, some difference between the two groups on the analytical thinking scale of the personality test. The investigator concluded that personality test performance and social factors did not define the points of difference between the two groups as effectively as did school achievement and cumulative records.

An adequate study of the factors which influence the achievement of students at a predominately Negro college was that of Matthew Nathaniel Cooper (19). He endeavored "to determine the nature and significance, if any, of certain differences in the social and personal adjustment of fifty-one successful and fifty-one non-successful college students at Texas Southern University." Students of the same ability as shown by the Army General Classification Test were paired on the basis of their grade point averages, one group containing students with grade point averages of at least 1 and the other containing students with averages below 1. The former group was called "successful," while the latter was called, "non-successful." The differences between these groups were searched for primarily in the area of social and personal adjustment. The instruments used were the MMPI; An Inventory of Factors STDCR: Guilford-Martin Inventory of Factors GAMIN; Guilford-Martin Personnel Inventory; Kuder Preference Record, Vocational Form C; Group Membership Record; ACE Personality Report; W-A-Y Technique; and an estimate of the expected terminal grade point average. After multivariate analyses and correlations, Cooper found that, as compared with the successful student, the unsuccessful individual was less self critical, less self analytic and meditative, possessed less emotional stability as seen by his teachers, had lower-grade point aspiration, and was less likely to be chosen by schoolmates for work on projects and places of responsibility. Female non-successful subjects possessed interests which deviated toward interests of opposite sex as shown by the MMPI female responses.

Three fairly recent studies which have implications of value to the area of Scholastic Achievement were made by Boykin (5), Rousseve (52), and

Harrison (34). The first study used the Bell Adjustment Inventory responses of 2,078 Negro college students of freshman classification, which were collected over a period of four years. The investigator assumed that these students would need attention to their problems and needs, even after they had reached the senior level. Two groups: "Well-Adjusted" and "Poorly Adjusted" were identified. Boykin found that the students seemed better adjusted, as a group, socially and least adjusted emotionally. Rousseve's analyses permitted him to conclude that many of the experiences of the Negro cause him to depreciate himself and to suffer as to self esteem. He recommended discovery of these characteristics and subsequent educational provisions which might aid in their elimination. Harrison's study was an analysis of the achievement motivational characteristics of a sample of Negro freshmen in a Southern college. He sought to determine whether their motivational traits were such as would cause them to have high levels of aspiration. Among his conclusions it was stated that ". . . It seems that the educational climate for youth with characteristics similar to those included in this study should (1) stress independence and competition with standards of excellence in performance, (2) provide for a re-orientation of outlook through experiences that would help the students to understand themselves and the realities of the world around them, and (3) provide opportunities for the students to discover and develop their potentialities."

Summary

There has been interest in the factors, other than ability, which influence scholastic success for many years. The early studies, however, were subjective, used rating scales more often than standardized, objective instruments, and relied on descriptive interpretations more often

than on statistical procedures. The studies of the last two decades show that the interest in this area is still present; probably because the character of personality and non-intellectual factors make their measurement and isolation difficult and also because there is a definite conviction that they are important in academic achievement. Descriptive interpretation has become a supplementary device, and statistical measures of significant differences are now being relied upon in the quest for an understanding of this area and its implications. With the increasing availability of electronic computers, capable of handling large numbers of variables, more research studies are using multivariate analysis and factorial manipulation. The future trend will perhaps find these approaches much more frequently used. The conclusions which have been presented by the investigators have not always been clear-cut, and in many instances their hypothetical assumptions have been disproved. However, there is the general acceptance of the fact that personality traits may cause or retard success in academic endeavors. There is a need for more agreement on the definition of the terms which are used, for more replication studies, and certainly, for more studies with Negro college students who fail to measure up scholastically to their potential promise.

CHAPTER III: PROCEDURES AND DESIGN OF THE STUDY

Selection of the Two Groups

Population of the Study and Selection of the First Sample

The low- and high-achieving students used in this study were originally members of a group of 669 beginning freshman students who enrolled for the first time at Alabama State College, Montgomery, in the fall of 1959. The Cooperative School and College Ability Test (SCAT) was one of the entrance tests administered to this group. Since SCAT scores were already available, the upper third of this original group of 669 was selected as the study population.

The Total Scores of the original group ranged from 245 to 312. The 66th percentile of the local scores[1] - 277 - was used as the cutting line for the selection of the upper third. This provided us with 227 students for the study.

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[1] Local scores and norms are more useful, in many instances, than are the so-called "representative," "class," or "National" norms. The Examiner's Manual for SCAT says on page 18, "For most interpretations of individual scores, and for many interpretations of group average scores, 'local norms' are even more useful than the best normative data the publisher can assemble. . . ." In College Testing, a Guide to Practices and Programs (18) which was published in 1959 by the American Council on Education, the section dealing with "Adequacy of Norms," pages 104-106, points out certain discrepancies in the use of normative group results in the interpretation of local situations. Test Service Bulletin, 39, Psychological Corporation publication, (60) also discusses test interpretation in local situations.

Selection of Pairs

Measurement of Achievement

The upper-third group of 227 students was now subjected to testing, for the purpose of determining achievement levels. Reading, English, and Science were used as the achievement areas, since all of the students were enrolled in these courses. In order to objectify the achievement records, it was decided to use standardized tests instead of grade point averages.[2]

The Iowa Silent Reading Test, New Edition, Form CM; Cooperative English Test, Form S ("Mechanics of Expression" and "Effectiveness of Expression"); and the Sequential Tests of Educational Progress Science Test were selected for use in the measurement of student achievement in the chosen areas. Each of these tests has been carefully prepared; the standardization procedures have followed scientifically approved patterns;[3] and each can be used for survey purposes. Both the Iowa Reading and the Cooperative English tests have been used widely in research investigations and as achievement measures. Titles of research reports, critical reviews, and discussions of these instruments have appeared in the Mental Measurements

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[2]This procedure would eliminate "halo effects" and the subjective judgments of the few teachers from whom the students have received instruction since enrolling at the college. It was also felt that cumulative averages would not be meaningful for this group since it was just in the third quarter of classwork.

[3]Manuals for these tests carry these procedures in detail and present the corroborating evidence.

Yearbooks (11, 12, 13). Davis describes the Iowa Silent Reading Test as one whose "total score is as valid a measure of the work-study type of reading as most reading tests are." Turnbull states that "Examination of this test suggests that its position of leadership in the field is justified" (11, p. 518). In reference to the Cooperative English Tests, Leonard mentions their value in deriving a comparable level of achievement and refers to the test as being "excellent for a short, quick survey of general abilities." Of the same test, Pooley makes the statement that "it is one of the best tests available in the field of English Skills" (11, p. 120). The STEP series was developed by the Educational Testing Service as a measure of student achievement to be used with the SCAT measure of the ability to achieve (14, p. 455). The science test is reviewed under Section 716 of the Fifth Mental Measurements Yearbook. Writing in this section, Stanley and Mann (14, p. 804) say: "Overall, the STEP science tests meet excellently the need for a well planned coordinated survey series stressing application of common curricular material to familiar situations."

The three achievement tests were administered to 220 members of the first sample. The raw scores made by the pupils on each of these tests were then converted into T-scores[4] since the separate tests did not belong to the same series. Averages of these achievement test T-scores were then derived so that the groups of high- and low-achieving students

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[4] J. P. Guilford (31, p. 494) states that the T-scale is a single common scale on which all groups have a common unit and a common zero point.

H. E. Garrett (28, p. 145) states that the T-score or normalized scores enable comparison and combination of test scores expressed in different units.

might be chosen.[5] The upper and lower quartiles of this T-score average distribution were then designated as high- and low-achieving groups respectively.

The Pairs

The subjects in the high- and low-achieving groups were matched as to sex, ability score, marital status, and third quarter enrollment status at the college. The final experimental group consisted of 96 students, 48 in each group. The high- and low-achieving groups each included twenty-four males and twenty-four females, making four sub-groups in all.

Securing Student Co-operation

The research investigation was approved by the president and by the administrative officials in charge of Freshman student activities. Students who were in the final groups and who were to become the subjects used in the study were contacted through their respective deans. The purposes and backgrounds of the study were given to them, and their voluntary assistance was solicited. They were assured that the test information was to be used objectively and that code numbers were to replace the names. The deans also sought the co-operation of the pupils and explained the uses which might be made of the findings. All of the selected pairs responded to the appeal which was made and participated in the study.

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[5] Normalized averages were used, since the procedures described above were substitutes for grade point averages.

Information Sought and Tests Used

1. General Information about the Students

The Sims Score Card for Socio-Economic Status was filled by all of the subjects in the experimental groups. This card, according to the Manual (54), was constructed in order that the general cultural, social, and economic backgrounds, as furnished by the homes of the children, might be obtained objectively through a simple but scientific device. The author emphasizes the merit of the statistical comparisons and quantitative records which may be obtained through this instrument.

Though the score card is designed specifically for use with pupils in grades four through twelve, inclusive, it was used with the subjects of this study as a means of obtaining comparable data on the family backgrounds of these individuals. The summary of these findings appears in the next chapter.

2. Personality - Edwards Personal Preference Schedule

The PPS as designed by Edwards is an instrument which would enable one to measure quickly and conveniently a number of relatively independent normal personality variables (23, p. 1). Though this inventory is relatively recent as to construction, it has been used frequently in research investigations. Unique characteristics, potentialities for use and research, and construction procedures are discussed in the Fifth Mental Measurements Yearbook (14, section 47). The fifteen variables (23, p. 5) which are measured and the major needs which they represent are as follows:

1. Achievement - The need to do one's best, to succeed;

2. Deference - The need to conform or to get suggestions;

3. Order - The need to have things organized;

4. Exhibition - The need to be noticed, or to be the center of attention;

5. Autonomy - The need for independence;

6. Affiliation - The need for strong attachments;

7. Intraception - The need to respond in terms of an analysis of the feeling and motives of others;

8. Succorance - The need for encouragement and affection from others;

9. Dominance - The need to lead or to direct others;

10. Abasement - The need for punishment when one is in the wrong and to feel timid with or inferior to others;

11. Nurturance - The need to minister to others;

12. Change - The need for novelty or experimentation;

13. Endurance - The need to persist in one's work or problem solutions;

14. Heterosexuality - The need to engage in companionate behavior with the opposite sex; and

15. Aggression - The need to criticize and to differ with others.

Measurement of personality is achieved with this test through having the individual choose from each of 225 pairs of statements the one which he feels to be more characteristic of his feelings or behavior. The forced choice technique is used, since the subject is asked - when neither statement is an accurate description - to choose the one which he considers least inaccurate. No omissions are allowed.

EPPS attempts to minimize the influence of social desirability in responses. It also seeks to avoid the clinical or maladjustive connotations which have been associated with many of the leading personality inventories. The Schedule has been validated and stabilized and has

become one of the most popular and useful personality scales now available. T-scores and comparative data are included in the manual (23).

3. Personality Adjustment - The Minnesota Multiphasic Personality Inventory

The MMPI was selected as a measure of the personality adjustment of the groups. This test was originally developed in a psychiatric setting to provide scores on the traits which are often characteristic of extreme psychological abnormality. It has, however, been used recently more and more often with normal people as a measure of general personality adjustment (66, 17, 64). Reviews of this test (11, 12, 13) are consistent in their acceptance of the inventory as being clinically useful. The standardization method, statistical work, and the organization and scale coverage are considered adequate. Rotter, of Ohio State University, states that MMPI "has an advantage over other inventories in that it attempts to measure the validity of the test for the particular individual with three different measures." He also points out that "The presence of several scales standardized on similar populations allows for studies of pupils and relationships rather than of related entities" (14).

The inventory is designed to provide, in one test instrument, scores on the important phases of personality (35). More than 500 statements, covering a variety of questions, are included. Some of these relate to physical conditions, others to morale and social attitudes. The testee marks the statements as accurately as possible, according to two categories: True or False. On the basis of the answers given, the personality characteristics of the subject may be grouped and interpreted as to the ranking on the nine clinical scales which are used with the inventory.

These scales, as listed and described in the Manual (35, pp. 19-21), are:

1. The Hypochondriasis Scale, which measures the amount of abnormal concern about bodily functions and health conditions;

2. The Depression Scale, which reveals whether an individual possesses normal optimism with regards to his future outlook or whether he feels useless and tends toward worry, narrowness of interests, lack of self confidence, and introversion;

3. The Hysteria Scale, which is a measure of the degree to which the subject is like patients who have developed such hysteria symptoms as paralyses, contractures, intestinal complaints, or cardiac symptoms;

4. The Psychopathic Deviate Scale, which measures the similarity of the subject to persons whose main difficulty lies in an inability to react with deep emotional response, a disregard for social mores, and a lack of the capacity to profit from experience;

5. The Interest (Masculinity-Femininity) Scale, which indicates the subject's deviation from or identification with the basic interest patterns of individuals of the same sex;

6. The Paranoia Scale, which identifies the subject with the type of patient who is suspicious, oversensitive, and possesses delusions of persecution;

7. The Psychasthenia Scale, which measures the similarity of the subject to psychiatric patients who are troubled by phobias such as unreasonable fears and exaggerated reactions to stimuli, or those who engage in compulsive behavior patterns;

8. The Schizophrenia Scale, which measures the similarity of the subject's responses to those patients who are characterized by bizarre and unusual thoughts or behavior; and

9. The Hypomania Scale, which measures the personality factor which characterizes those persons who are markedly overproductive in thought and action.

Validation and testing results have shown that the extreme scores, high and low, are indications of certain tendencies toward maladjustment. Profiling of the T-scores derived on the test reveals these symptomatic syndromes.

4. Interests - Kuder Preference Record

The Kuder Preference Record - Vocational, Form C, was used to discover the types of activities preferred by the individual group members. The Record is one of the most popularly used of all interest inventories as may be seen by the large number of investigations which have used it as a measuring instrument. Buros (11, 12, 13) carries several hundred studies in the lists included in the Yearbook. Carter states that "Published research has indicated that the various scores provided by the Kuder Preference Record are satisfactory in reliability and a digest of such studies leads to the judgment that this test is one of the best from the standpoint of validity" (12).

KPR measures preferences in ten broad areas (43). Among these interests are:

1. Outdoor - a preference for work on the outside among animals and growing things;
2. Mechanical - a liking for machines and tools;
3. Computational - an interest in work which deals with numbers;
4. Scientific - a desire to discover new facts and to solve problems;
5. Persuasive - an interest in visiting and dealing with people and promoting projects and sales;
6. Artistic - a preference for creative work with the hands;
7. Literary - an interest in reading and writing;
8. Musical - a liking for concerts, instrumental or vocal music, and musical history;
9. Social Service - a preference for helping people; and
10. Clerical - an interest in office work that requires precision and accuracy.

Two choices are made in each group of three items (the best liked and the least liked of the listed activities). The scored answers furnish a profile grouping which designates the general areas of interest and disinterest which have been marked by the subject. The coding of the scores also gives some insight into the revealed occupational interests of the subject (43).

5. Study Habits and Attitudes - Brown-Holtzman Survey of Study Habits and Attitudes

The SSHA is the result of Brown and Holtzman's "effort to construct and validate a self-rating questionnaire that would measure a student's attitude and motivation toward studying, as well as his study habits per se"(7). The final revision of the inventory constituted a Survey of Study Habits and Attitudes "designed to meet the need for an easily administered, valid measure of study methods, motivation for studying, and related attitudes of importance in scholastic success" (8).

The final form of the questionnaire includes 75 items. The instrument was developed to meet the challenge posed by the fact that many students of high academic ability do more poorly in school than others of low ability. Its purposes are three: (1) the identification of students whose study habits and attitudes differ from those who have high academic achievement; (2) the motivation of an understanding of pupils who have academic difficulties; and (3) to give factual information which could be used to aid pupils to achieve more desirable academic goals through the improvement of their study habits and attitudes.

On the basis of intercorrelations which were made among SSHA scores, ACE scores, and course grades for a selected group of pupils, it was concluded that the questionnaire measures traits which"play an

important role in academic success and which are not assessed by an aptitude test" (37).

Administration of Tests

Three sessions were used in collecting the test data from the subjects used in the investigation. Session One was used to administer the Edwards Personal Preference Schedule and to obtain the information gathered by the Sims Score Card. The Minnesota Multiphasic Personality Inventory was given at the second testing period. At the final testing session, the Kuder Preference Record and the Brown-Holtzman Survey of Study Habits and Attitudes were completed by the subjects.

Statistical Procedures

The major purpose of this study, as set forth in Chapter One, was to determine if there were measurable differences in the non-intellectual characteristics of the experimental groups. The writer was interested in making a sharp discrimination as to the extent of these differences, as well as the presence or absence of similarity between the matched pairs and between the sexes. Because of this objective, partial regression analysis was made of the 38 variables covered by the three multi-variable non-intellectual tests which were administered. The weighted measures that were derived were then combined so as to give composite scores which would provide an optimum separation of the two groups. Use of such scores is considered a valuable approach in psychological studies and research (31, 58, 62, 63).

The derived composite scores of the experimental groups were compared through the analysis of variance process. The single variable test scores were also analyzed through this statistical method. Group

comparisons covered achievement, sex, and test differences. The original hypotheses were tested and accepted, or rejected, on the basis of the significant differences which were found. The discussion of these procedures, the findings, and the conclusions will be found in subsequent chapters.

Profiles were made of the EPPS, MMPI, and KPR responses for each of the 96 subjects. These furnished a means of making an inspection comparison of the differences between groups and individuals in the groups. They were also of value in the process of discovering the extreme scores on the variables of the tests.

CHAPTER IV

PRESENTATION AND INTERPRETATION OF DATA

Ability

As stated in the study design and procedures section of the preceding chapter, the experimental sample for this investigation was drawn from a population of 669 freshmen who entered Alabama State College (Montgomery) in September of 1959, and for whom there were available, scores made on the Cooperative School and College Ability Test.[6] The distribution of SCAT scores for this total group is found in Appendix A. Subjects with scores falling above the 66th percentile of 277 were then selected as the upper-third experimental population from which the research sample was selected. There were 227 individuals in this group.

Achievement

The comparative distributions of the low- and high-achieving groups for subject matter achievement are shown in Appendix B. These groups were selected from the experimental population on the basis of their rating on the achievement tests which were administered to that group. Two hundred twenty of the selected ability group of 227 were tested in the achievement areas of English, Reading, and Science through

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[6] In the files of the Testing Service.

the use of the measures and procedures described in Chapter Three.[7] Each individual area score distribution was transformed into a T-score distribution so that a normalized achievement test average might be obtained for each member of the experimental population. Since these averages were computed from the pupils' scores on the three standardized tests through objective techniques, they were used in lieu of grade point averages, which are often affected by the subjective judgments and opinions of the individual instructors who assign the various grades.

Examination of the achievement test score distributions for the low- and high-achieving groups, as displayed in Appendix B, reveals overlapping of the scores made by some of the subjects on the separate area tests. This is to be expected, however, since the members of both groups belong to the same ability population and possess the potentialities for adequate achievement.

Selection of High- and Low-Achieving Groups

The separate T-scores of the 220 students taking all of the subject area tests were combined, and an average T-score derived for each individual. These average scores ranged from a low of 31 to a high of 72. Those students who fell within the middle 50 per cent of the total distribution were eliminated, and the lower and upper quartile groups designated reqpectively as the low- and high-achieving groups for the present study. Since ability was the controlled variable, this selective procedure was thought to be a valid means of determining those individuals who were falling below their potential and those who were maintaining high

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[7] All tests used in this study were scored on IBM test-scoring machines.

achievement levels. There were originally fifty-five subjects in each of the achievement groups. The establishment of matched pairs on the bases of mental ability, sex, achievement status, and approximate age levels resulted in the final group of 96 persons distributed as shown in Table I, into low- and high-achieving groups of 48 persons each, with four sub-groups, each containing 24 subjects.

The high achieving males range from 57 to 72 on the T-score average distribution, while the range of the high-achieving female subjects falls between 57 and 69. The low-achieving males are grouped from 33 through 44; low-achieving females from 30 to 44. The sub-groups as shown by their normalized-average distributions, seem well matched in terms of low- and high-achievement. Though the distance between the upper level of the low-achieving group and the lower level scores of the high-achieving group covers only thirteen points, it must be remembered that this distance is one of T-score units and represents a much larger raw or original-score area.

Table 1 shows the School and College Ability Test score distributions for the high- and low-achieving groups as selected by the procedures described in the paragraphs above. The means of the two groups are approximately the same, there being only one point difference between the High Male and the High Female groups, and between the Low Male and Low Female groups when the averages are rounded off. Similarly, there is little difference between the abilities of the high- and low-achieving groups as measured by this specific test. The difference measures (t and F), also shown in Table 1, are not significant, thus substantiating the assumption that the ability factor was held reasonably constant, and the achievement differences must be attributed to other factors.

TABLE 1

FREQUENCY DISTRIBUTIONS OF SCHOOL AND COLLEGE ABILITY TEST SCORES OF HIGH- AND LOW-ACHIEVING GROUPS BY SEX

Score Interval	High Achievers		Low Achievers	
	Male	Female	Male	Female
312	1			
310		1	1	
308	2	1	1	
306		1	1	2
304		1		1
302	1	1	1	
300	2	1	1	2
298	2		2	2
296	4	2	2	1
294	1	4	3	2
292	1		4	3
290	3	2	1	1
288	1	1	2	3
286		1	1	3
284	1	3	2	1
282	2	4	2	3
280	3	1		
Totals	24	24	24	24
Range	280-312	280-311	282-310	282-307
Mean	293.8	292.7	294.3	292.8
S.D.	9.0	9.0	7.6	7.3
	t=.54 F=1.00		t=.14 F=1.08	

Other Background Information About the Two Groups

The Sims Socio-Economic Score Card completions made by the two experimental groups were examined to determine whether there were exaggerated dissimilarities between them. Summarization of the data found on the first page of the Sims blanks showed that the family and parental status of these subjects was not strikingly different. The age ranges of the two groups were comparable, extending from 17 years 5 months to 22 years for the high-achieving males and from 17 years 3 months to 22 years for the low-achieving males. For the female groups, the high-achieving range was from 17 years 7 months to 19 years 10 months, and the low-achieving range extended from 17 years 2 months, to 19 years 8 months. The occupational areas listed for the fathers covered the same types for all of the sub-groups, with no overloading of any group in any type or level of occupational classification.

The total score, as derived through the procedure listed in the manual of directions, was found for each of the 96 subjects. The distributions of these total scores, by groups and according to sex, are shown in Appendix C. There is no appreciable difference between these total scores, or between the mean averages and standard deviations derived from them. The majority of the subjects received scores which may be rated from "Medium" to "High." Six exceptions were found to rate above the "High" category, and two fell below the "Medium" rating.

The analysis of the general background information gives some basis for the conclusion that the differences in the achievement of the two experimental groups may not be attributed to differences in age, family, social, or economic status. The matched pairs were coded for

investigating non-intellectual factors which might affect the achievement differences of the experimental groups.

Comparison of High- and Low-Achieving Groups on Non-Intellectual Factors

Three of the four tests[8] which were selected to measure the non-intellectual characteristics were multi-variable. Analysis of the single variable test, the SSHA, will be made separately; the others will be discussed in a subsequent section.

The Study Habits and Attitudes of the High- and Low-Achieving Groups

The SSHA scores for the two groups were examined and compared with the norm scores for college men and women. Of the high-achieving male subjects, fourteen either reached or exceeded the percentile norms which have been derived for college men (8, p. 5). In the case of the high-achieving females, seventeen reached or exceeded the percentile norm for college women (8, p. 5). Only seven low-achieving females and eleven low-achieving males reached or exceeded their respective percentile norm scores.

Appendix D shows the T-score distributions for the high- and low-achieving groups by sex. Analysis of variance was made of these scores to determine whether there were group differences related to achievement and to sex. The results of this analysis are summarized in Tables 2 and 3.

The very low F ratios between sex, as indicated in Tables 2 and 3, imply that there is no characteristic difference attributable to sex.

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[8]The tests were described in Chapter Three.

There is, however, a significant difference on the basis of achievement, a trend which was also indicated in the raw score comparisons given in the preceding discussion and substantiated by the significant F ratio of 7.78 (significant at the 0.01 level of significance) which is found in Table 2. Since a significant interaction between sex and achievement did not exist, a new variance estimator was computed. Table 3 shows the F ratio of 7.69, significant at the 0.01 level of significance, which was derived from this computation.

TABLE 2

ANALYSIS OF VARIANCE OF T-SCORES OBTAINED ON THE BROWN-HOLTZMAN SURVEY OF STUDY HABITS AND ATTITUDES

Source of Variation	Sum of Squares	df	Mean Square	F
Between Sex	20.167	1	20.167	.238
Between Achievement	693.375	1	693.375	7.783*
Interaction: Sex X Achievement	187.042	1	187.042	2.100
Within (Residual)	8,195.917	92	89.086	
Total	9,096.501	95		

*Significant at the 0.01 level of significance

TABLE 3

ANALYSIS OF VARIANCE OF T-SCORES OBTAINED ON THE BROWN-HOLTZMAN SURVEY OF STUDY HABITS AND ATTITUDES (POOLED RESIDUAL)*

Source of Variation	Sum of Squares	df	Mean Square	F
Between Sex	20.167	1	20.167	.224
Between Achievement	693.375	1	693.375	7.692**
Within (Residual)	8,382.959	93	90.139	
Total	9,096.501	95		

*Since interaction in Table 2 was shown to be insignificant, it was pooled with the residual

**Significant at the 0.01 level of significance

The Personality and Interest Characteristics of the High- and Low-Achieving Group

Profiles of the personality tests: EPPS and MMPI, and of the KPR interest inventory were made for each of the 96 subjects of the investigation. These profiles were used primarily for inspectional purposes and to aid in the final decision as to the interpretation of the scores.

Thirty-eight variables were included in the three test instruments: 15 for the EPPS; 13 for the MMPI; and 10 for the KPR. The scores made by the 96 subjects on these variables are shown in Appendixes E, F, and G. These scores were interpreted together, and since each variable does not always have the same contributory effect on group differences, composite scores for the separate tests were derived for each of the 96 subjects. These composite scores are also shown in the three above-listed appendixes and in Appendix K.

Partial regression analysis was made of the T-scores so that irrelevant variables could be eliminated and optimal weights assigned to those variables which contributed most significantly to the measurable differences. Appendixes H, I, and J show the variable intercorrelations.[9]

The results of the partial regression analysis which was made in the University of Oklahoma Computor Laboratory showed that only 10 of the 38 variables contributed significantly to the composite scores. These were: "Achievement," "Deference," and "Order" on EPPS; the validity

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[9] Computations for the intercorrelations, composite scores, and variance analyses were done through machine operations at the University of Oklahoma Computor Laboratory.

scales: "Lie," "F," and "K" on MMPI; and the "Mechanical," "Scientific," "Persuasive," and "Musical" variables of KPR. These significant variables were used to arrive at the computed composite scores. The other variables were eliminated because of their lack of statistical significance, as reflected in the number of low and negative correlations in the intercorrelation tables.

An analysis of variance was made on these composite scores in order to determine whether there were sex, achievement, and separate test differences. The summary of this analysis is found in Table 4 and Table 5.

The data of Table 4 show that there is a difference (F: 9.93, significant at the 0.01 level of significance) between the EPPS, MMPI, and KPR composite scores of the two achievement groups. A sex difference, significant at the 0.001 level of significance, is also indicated by the F ratio of 113.37. In the case of the first order interactions, the F ratios for achievement and sex, and for achievement and tests, were not significant. The interaction between sex and tests gives an F ratio of 11.76, significant at the 0.01 level of significance.

The second order interaction (between achievement and sex and tests) being non-significant permitted pooling with the residual error to form a new variance estimator, since the lack of significance is probably due to random error. Table 5 shows the results of the computation after the pooling of the errors. Significant differences are found for achievement, 0.01 level of significance; sex, 0.001 level of significance; and between the interaction of sex and tests at the 0.01 level of significance.

TABLE 4

ANALYSIS OF VARIANCE OF COMPOSITE SCORES DERIVED BY PARTIAL REGRESSION ANALYSIS OF T-SCORES OBTAINED ON EPPS, MMPI, AND KPR

Source of Variation	Sum of Squares	df	Mean Square	F
Replicates	8,657.832	23	376.428	.739
Achievement	5,058.503	1	5,058.503	9.932*
Sex	57,743.347	1	57,743.347	113.369**
Tests	0.0196	2	0.0098	.000019
Achievement X Sex	2.569	1	2.569	.0050
Achievement X Tests	22.961	2	11.481	.0225
Sex X Tests	11,977.906	2	5,988.953	11.758*
Achievement X Sex X Tests	1,555.552	2	777.776	1.527
Error	128,862.860	253	509.339	
Total	213,881.549	287		

*Significant at 0.01 level of significance
**Significant at 0.001 level of significance

TABLE 5

ANALYSIS OF VARIANCE OF COMPOSITE SCORES DERIVED BY PARTIAL REGRESSION ANALYSIS OF T-SCORES OBTAINED ON EPPS, MMPI, AND KPR (POOLED ERROR)*

Source of Variation	Sum of Squares	df	Mean Square	F
Replicates	8,657.832	23	376.428	.736
Achievement	5,058.503	1	5,058.503	9.810**
Sex	57,743.347	1	57,743.347	112.902***
Tests	0.0196	2	.0098	.000019
Achievement X Sex	2.569	1	2.569	.0050
Achievement X Tests	22.961	2	11.481	.0024
Sex X Tests	11,977.906	2	5,988.953	11.710**
Error	130,418.412	255	511.445	
Total	213,881.549	287		

*Since higher order interaction, Table 4, was shown to be insignificant, it was pooled with the Error

**Significant at 0.01 level of significance

***Significant at 0.001 level of significance

Evaluation of the Hypotheses

The hypothesis basic to this study - There are no significant differences in the dimensions of the personality characteristics of the high- and low-achieving groups of the study - was not supported by the statistical analyses. An evaluation of the tests made on the individual hypotheses results in the rejection of this hypothesis.

The first, second, and third hypotheses relate to the differences between the high- and low-achieving groups in personality traits, personality patterns, and interests. As stated in Chapter One, they read:

> Hypothesis 1. There will be no significant differences between high- and low-achieving students on the composite scores derived from the fifteen variables of the Edwards Personal Preference Schedule.
>
> Hypothesis 2. There will be no significant differences between the high- and low-achieving groups on the composite scores derived from the thirteen variables of the Minnesota Multiphasic Personality Index.
>
> Hypothesis 3. There will be no significant differences between the high- and low-achieving groups on the composite scores derived from the ten variables of the Kuder Preference Record.

The analysis of variance of the composite scores of EPPS, MMPI, and KPR indicated differences between the scores of the high- and low-achieving groups which were significant at the 0.01 level of significance. Hypotheses 1, 2, and 3 must thus be rejected on the basis of this evidence.

Hypothesis 4 states that "There will be no significant differences between the high- and low-achieving groups on the scores made on the Brown-Holtzman Survey of Study Habits and Attitudes." This hypothesis must also be rejected, since an analysis of variance on the data obtained through the SSHA showed that there was a difference between the scores of the high- and low-achieving students, significant at the 0.01 level of significance.

Hypothesis 5 relates to the sex variation in the scores of the two groups and states:

> "There will be no significant differences between the high- and low-achieving groups on the results of the Edwards Personal Preference Schedule; Minnesota Multiphasic Personality Inventory; Kuder Preference Record; and Brown-Holtzman Survey of Study Habits and Attitudes, with respect to sex variations."

A difference was found between the composite scores made by the sexes on the EPPS, MMPI, and KPR tests. This difference, also established through an analysis of variance, was highly significant, at the 0.001 level, thus rejecting this hypothesis with respect to these tests. Analysis of variance on the scores made by the groups on the SSHA indicated no significant differences between the scores of the two sexes. Hypothesis 5, as it relates to study habits and attitudes, must be accepted.

The sixth hypothesis states that: "There will be no significant interactions between any combination of these variables: (A) Achievement, (B) Tests, and (C) Sex." The analysis of variance indicated the existence of a significant (0.01 level of significance) interaction between sex and tests in the composite scores of the EPPS, MMPI, and KPR. This hypothesis can be accepted only in relation to this specific interaction on these specific tests and scores. It must be rejected as it relates to the interactions of achievement and sex; achievement and tests; achievement and sex and tests; on all of the scores, and also to sex and tests as this interaction relates to the SSHA scores.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

The major purpose of this study was to determine whether there were measurable differences between the dimensions of the non-intellectual characteristics of selected groups of low- and high-achieving students; and whether these characteristics indicated sex variations.

An experimental upper-third population of 227 students was selected from 669 entering freshmen at Alabama State College (Montgomery) on the basis of their scores and local percentile levels on the Cooperative School and College Ability Test. Standardized achievement tests in English, Reading, and Science were administered to this population, and the upper and lower quartile groups of the resulting normalized achievement-average distribution were selected as the high- and low-achieving students of the upper-third ability level. Ninety-six subjects, 48 pairs matched on the bases of ability, sex, approximate age, and background, were then classified as the high- and low-achieving subjects for this investigation.

The non-intellectual characteristics of personality, personality adjustment, interests, and study habits and attitudes (as possessed by the experimental groups) were investigated through the variables covered by the Edwards Personal Preference Schedule; the Minnesota Multiphasic

Personality Inventory; the Kuder Preference Record; and the Brown-Holtzman Survey of Study Habits and Attitudes. The normalized multi-variable scores made on the first three tests were combined, through partial regression analysis, into composite scores for each of the 96 subjects. Variance analysis was made of these composite scores and of the normalized SSHA scores of the high- and low-achieving groups.

Conclusions

Statistical analyses of the test scores made between high- and low-achieving groups participating in this study suggest the following conclusions:

1. There is a significant difference between the dimensions of those non-intellectual characteristics of personality needs, personality adjustment, and interests possessed by the high- and low-achieving experimental groups.
2. There is a significant difference between the dimensions of the study habits and attitudes of the high- and low-achieving groups.
3. There is a significant difference between the dimensions of the non-intellectual personality and interest characteristics possessed by members of the sex groups.
4. There is no significant difference between the dimensions of the study habits and attitudes of the sex groups.

Recommendations

On the basis of the procedures, analyses, and findings of this study, the writer recommends that:

1. An analysis be made of the extreme scores (above or below the criterion level of the test) made by the subjects of the present study on each of the multivariable tests, in order to determine group differences as they relate to "extreme" ratings; and that the administrative officials of the college examine carefully the extreme scores made on the MMPI and the EPPS so that they may have a picture of some of the personality adjustment trends and the personality needs which were revealed by these test results.
2. An IBM analysis be made of the responses given by the group members of this study to the Brown-Holtzman SSHA to determine whether certain habits and attitudes were specifically characteristic of either group.
3. In subsequent studies which are made of the non-intellectual traits of college students and their relation to achievement, the investigators explore the validity of selecting the upper- and lower-achieving groups on the basis of their upper-quartile or lower-quartile status on each of the standardized subject-matter tests used, rather than solely on the average of the scores made on the separate tests.

BIBLIOGRAPHY

1. Altus, W. D. A college achiever and non-achiever scale for the Minnesota Multiphasic Personality Inventory. J. Appl. Psychol., 1948, 32, 385-397.

2. Bayliss, Z. B. A study of factors contributing to the unsatisfactory scholastic attainment of first year women students. J. Edu. Res., 1934, 27, 687-697.

3. Blanks, A. C. A comparative study of mentally bright and mentally dull Negro high school seniors (with reference to personality, background, school achievement, interest, ambition and school marks. Unpublished Doctor's dissertation, New York Univ., 1954.

4. Boyce, E. M. A comparative study of over achieving and under achieving college students on factors other than scholastic aptitude. Unpublished doctor's dissertation, Univ. of Wisconsin, 1956.

5. Boykin, L. L. The adjustment of 2,078 Negro students. J. of Negro Edu., 1957, 26, 75-79.

6. Brandenberg, G. C. Analyzing personality, Part I. J. Appl. Psy., 1925, 9, 139-156.

7. Brown, W. F. and Holtzman, W. H. A study-attitudes questionnaire for predicting academic success. J. Educ. Psychol., 1955, 46, 75-84.

8. Brown, W. F. and Holtzman, W. H. Manual, Brown-Holtzman Survey of Study Habits and Attitudes. New York: Psychol. Corp., 1956.

9. Bunin, S. M. Non-intellectual dimensions of some academic performance. Unpublished doctor's dissertation, The Univ. of Texas, 1960.

10. Burgess, E. Personality factors of over and under-achievers in engineering. Unpublished doctor's dissertation, Penn. State Univ., 1953.

11. Buros, O. K. (ed.). The Third Mental Measurements Yearbook. New Brunswick: Rutgers Univ. Press, 1949.

12. Buros, O. K. (ed.). The Fourth Mental Measurements Yearbook. Highland Park: Gryphon Press, 1953.

13. Buros, O. K. (ed.). The Fifth Mental Measurements Yearbook. Highland Park: Gryphon Press, 1959.

14. Caliver, A. A Background Study of Negro College Students. Washington: United States Government Printing Office, 1933.

15. Caliver, A. A personnel study of Negro college students. Contr. Educ., Teach. Coll., Columbia Univ., 1931, 484.

16. Cash, W. L. Relation of personality traits to scholastic aptitude and academic achievement of students in a liberal protestant seminary. Unpublished doctor's dissertation, Univ. of Michigan, 1954.

17. Clark, J. H. The interpretation of the MMPI profiles of college students: mean scores for male and female groups. J. Soc. Psychol., 1954, 40, 319-321.

18. Committee on Measurement & Evaluation. College Testing: A Guide to Practices and Programs. Washington: Amer. Council on Edu., 1959.

19. Cooper, M. N. To determine the nature and significance, if any, of certain differences in the social and personal adjustment of fifty-one successful and fifty-one non-successful college students at Texas Southern University. Unpublished doctor's dissertation, New York Univ., 1955.

20. Diener, C. L. A comparison of over-achieving and under-achieving students at the University of Arkansas. Unpublished doctor's dissertation, Univ. of Arkansas, 1957.

21. Educational Policies Commission. Manpower and Education. N.E.A. of U. S. & Amer. Ass'n. Sch. Admin., Washington: 1956.

22. Edwards, A. L. Experimental Design in Psychological Research. (Rev. ed.) New York: Rinehart, 1960.

23. Edwards, A. L. Manual for the Edwards Personal Preference Schedule. New York: Psychol. Corp., 1954.

24. Edwards, A. L. Statistical Analysis. (Rev. ed.) New York: Rinehart, 1958.

25. Fisher, R. A. Contributions to Mathematical Statistics. New York: John Wiley & Sons, 1950.

26. Fisher, R. A. Statistical Methods for Research Workers. (11th Rev. ed.) New York: Hafner, 1950.

27. Fisher, R. A. The use of multiple measurements in taxonomic problems. In Annals Eugenics, VII, Pt. II, 1936. (Reproduced in Contributions to Mathematical Statistics, R. A. Fisher), 178-188.

28. Garrett, H. E. Elementary Statistics. New York: Longmans Green, 1956.

29. Gebhart, A. A. & Hoyt, D. P. Personality needs of under- and over achieving freshmen. J. Appl. Psychol., 1958, 42, 125-128.

30. Ginzberg, E. et. al. The Negro Potential, New York: Columbia Univ. Press, 1956.

31. Guilford, J. P. Fundamental Statistics in Psychology and Education. New York: McGraw Hill, 1956.

32. Harris, D. Factors affecting college grades: a review of the literature (1930-37). Psychol. Bull., 1940, 37, 125-166.

33. _____ The relation to college grades of some factors other than intelligence. Arch. of Psychol., 1931, No. 131, 1-55.

34. Harrison, E. C. Achievement, motivation, characteristics of Negro college freshmen. Pers. & Guid. J., 1959, 38, 146-149.

35. Hathaway, S. R. & McKinley, J. C. Manual for the Minnesota Multiphasic Personality Inventory. (Revised). New York: Psychol. Corp., 1951.

36. Hewer, V. H. A comparison of successful and unsuccessful students in the medical school at the University of Minnesota. J. Appl. Psychol., 1956, 40, 164-168.

37. Holtzman, W. H., Brown, W. F., & Farquhar, W. G. The survey of study habits and attitudes; a new instrument for the prediction of academic success. Educ. & Psychol. Meas., 1954, 14, 726-732.

38. Horrall, B. M. Academic performance and personality adjustments of highly intelligent college students. Genet. Psychol. Monog., 1957, 55, 3-83.

39. Jensen, V. H. Influence of personality traits on academic success. Pers. & Guid. J., 1958, 36, 497-500.

40. Kardiner, A. and Ovesy, L. Psychodynamic inventory of Negro personality. In The Mark of Oppression. New York: Norton, 1951.

41. Karon, B. P. The Negro Personality. New York: Springer, 1958.

42. Knaak, N. K. A study of the characteristics of academically successful and unsuccessful freshmen women who entered Northwestern University in the fall of 1954. Unpublished doctor's dissertation, Northwestern Univ., 1956.

43. Kuder, G. F. Examiner Manual Kuder Preference Record, Vocational Form C. (6th ed.). Chicago: Science Res. Assoc., Inc., 1956.

44. McQuary, J. P. Some relationships between non-intellectual characteristics and academic achievement. J. Educ. Psychol., 1953, 44, 215-228.

45. Meister, M. We have neglected talent. In Education for the Gifted, 57th Yearbook, Nat. Soc. Study Educ., Part II. Chicago: Univ. Chicago Press, 1958.

46. Morgan, H. H. A psychometric comparison of achieving and non-achieving college students of high ability. J. Consult. Psychol., 1952, 16, 292-298.

47. National Manpower Council. A Policy for Skilled Manpower. New York: Columbia Univ. Press, 1954.

48. Noble, J. L. Future educational emphasis: psychological or sociological. J. Negro Educ., 1956, 25, 402-409.

49. Owens, W. A. & Johnson, W. C. Some measured personality traits of collegiate underachievers. J. Educ. Psychol., 1949, 40, 41-46.

50. Plaut, R. L. Blueprint for Talent Searching: America's Hidden Manpower. New York: Nat'l Scholarship Service & Fund for Negro Students, 1957.

51. Raley, C. L. Personality traits of high-academic achievers at Oklahoma Baptist University. Unpublished doctor's dissertation, Univ. of Oklahoma, 1959.

52. Rousseve, R. J. An analysis of the personality stresses of Negro Americans and their implications for education. Unpublished doctor's dissertation. Univ. of Notre Dame, 1958.

53. Shaw, M. C., & Brown, D. J. Scholastic underachievement of bright college students. Pers. & Guid. J., 1957, 36, 195-199.

54. Sims, V. M. Manual of Directions for the Sims Score Card for Socio-Economic Status. Bloomington: Public School Publishing Co., 1927.

55. Stagner, R. The relation of personality to academic aptitude and achievement. J. Educ. Res., 1933, 26, 648-660.

56. Stone, C. L. Disparity between intelligence and scholarship. J. Educ. Psychol., 1922, 13, 241-244.

57. Stone, D. R. & Ganung, G. R. Study of scholastic achievement related to personality as measured by the Minnesota Multiphasic Personality Inventory. J. Educ. Res., 1956, 50, 155-156.

58. Tatsuoka, M. & Tiedeman, D. V. Discriminant analysis. Rev. Educ. Res., 1954, 24, Chap. 5.

59. Taylor, H. R. The scholastic significance of certain personality traits. Psychol. Bull., 1933, 20, 600.

60. The Psychological Corporation. Norms must be relevant. Test Service Bulletin, 1950, No. 39.

61. Thompson, J. S. A study of the relationships between certain measured psychological variables and achievement in the first year of theological seminary work. Unpublished doctor's dissertation, Univ. Minn., 1956.

62. Tiedeman, D. W. The utility of the discriminant function in psychological guidance investigations. Harvard Educ. Rev., 1951, 21, 71-80.

63. Travers, R. M. W. The use of a discriminant function in the treatment of psychological group differences. Psychometrika, 1939, 4, 25-32.

64. Tyler, F. T. & Michaelis, J. U. A comparison of manual and college norms for the M. M. P. I. J. Appl. Psychol., 1953, 37, 73-75.

65. Volle, A. H. A comparison of characteristics of academically most and least successful college freshmen. Unpublished doctor's dissertation, Northwestern Univ., 1953.

66. Welsh, G. S. & Dahlstrom, W. G. (eds.). Basic Readings on the MMPI in Psychology and Medicine. Minneapolis: Univ. Minn. Press, 1956.

67. Wolf, S. J. Historic background of the study of personality as it relates to success or failure in academic achievement. J. Gen. Psychol., 1938, 19, 417-436.

68. Wolfle, D. America's Resources of Specialized Talent. New York: Harper, 1954.

APPENDIX A

APPENDIX A

DISTRIBUTION OF SCHOOL AND COLLEGE ABILITY TEST SCORES FOR 669 BEGINNING FRESHMAN STUDENTS

Score Interval	Frequency
310	3
305	9
300	17
295	30
290	27
285	39
280	61
275*	87*
270	119
265	105
260	70
255	56
250	39
245	7
N=	669

P_{50}=271.9 Mean=273.3
P_{66}=277.2 SD = 13.35

*227 Students made scores above 277 and were included in the population for the experimental study.

APPENDIX B

APPENDIX B

DISTRIBUTION OF T-SCORES FOR THREE ACHIEVEMENT TESTS BY SEX IN GROUPS

T-Scores	English				Reading			
	High Achievers		Low Achievers		High Achievers		Low Achievers	
	Male	Female	Male	Female	Male	Female	Male	Female
78-80					1			
75-77								1
72-74	5	1			3	1		
69-71					2			
66-68	1	7			2	1		
63-65	7	5			2	8		
60-62					7	9		
57-59	8	5			5	4		1
54-56	2	4		1	2	1		
51-53		1	3	1				4
48-50	1	1	1	3			3	4
45-47			2	4				
42-44			2	2			4	3
39-41			2	6			8	6
36-38			4	2			3	1
33-35			4	3			3	2
30-32			4	1			3	1
27-29			1					
24-26			1	1				
21-23								2

APPENDIX B--Continued

T-Scores	Science				Average			
	High Achievers		Low Achievers		High Achievers		Low Achievers	
	Male	Female	Male	Female	Male	Female	Male	Female
78-80								
75-77	1							
72-74					1			
69-71	4	1			4	1		
66-68	4	1			2	1		
63-65	2	2			4	2		
60-62	4	3	1		4	9		
57-59	4	13	1		9	11		
54-56	1							
51-53	4	4	3	3				
48-50								
45-47								
42-44			7	5			10	12
39-41							4	5
36-38			7	4			6	4
33-35			2	9			4	2
30-32								1
27-29			3	3				
24-26								
21-23								

APPENDIX C

APPENDIX C

TOTAL SCORES ON THE SIMS SCORE CARD FOR SOCIO-ECONOMIC STATUS FOR HIGH- AND LOW-ACHIEVING GROUPS BY SEX

Score Interval	High Achievers N=48		Low Achievers N=48	
	Male	Female	Male	Female
	Frequency	Frequency	Frequency	Frequency
30	1			
28				
26	2	2		
24	1			
22		1	1	
20	2		2	2
18	6	4	3	2
16	3	2	3	5
14	4	7	7	5
12	2	6	6	6
10	3	2	2	2
8				
6				1
4				1
Total	24	24	24	24
Mean	17.6	14.9	15.8	14
SD	5.1	4.3	2.8	3.8

APPENDIX D

APPENDIX D

T-SCORES DERIVED FROM THE BROWN HOLTZMAN SURVEY OF STUDY HABITS AND ATTITUDES

Subject	High Achievers		Low Achievers	
	Male	Female	Male	Female
1	52	48	68	40
2	52	30	34	45
3	24	48	48	48
4	48	45	68	48
5	62	57	34	45
6	52	48	40	40
7	52	57	48	45
8	40	45	52	34
9	45	68	45	45
10	76	68	30	57
11	57	52	52	52
12	62	62	52	45
13	57	52	57	40
14	40	62	52	52
15	57	48	48	57
16	45	45	52	40
17	68	57	40	52
18	48	57	57	48
19	40	62	52	34
20	52	57	52	45
21	40	52	34	57
22	68	45	48	40
23	40	57	57	34
24	62	62	57	45

APPENDIX E

APPENDIX E

T-SCORES AND THE COMPOSITE SCORES DERIVED FROM THE 15 VARIABLES OF THE EDWARDS PERSONAL PREFERENCE SCHEDULE FOR 48 HIGH-ACHIEVING AND 48 LOW-ACHIEVING STUDENTS

A. High Achievers (Male)

Subject	Variables															Composite Score
	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	
1	61	36	36	57	54	52	38	80	61	35	54	40	30	22	61	82.1
2	44	32	66	32	40	43	59	51	27	60	54	47	64	49	57	17.7
3	63	55	54	63	49	29	56	48	49	45	40	45	53	43	64	59.2
4	51	38	61	49	49	42	46	48	57	54	42	55	47	65	53	65.3
5	51	38	61	49	54	52	40	55	43	58	62	49	54	49	53	41.2
6	39	44	47	38	42	64	50	65	27	45	75	51	39	63	53	3.2
7	73	55	56	43	56	38	50	44	22	29	44	59	58	51	53	49.6
8	53	61	52	49	54	48	42	53	43	60	48	43	59	51	44	44.7
9	61	52	52	43	47	36	46	59	61	54	46	51	36	56	46	95.5
10	41	63	61	43	42	64	57	51	41	56	54	49	53	32	47	25.9
11	48	66	54	55	47	32	63	40	41	45	44	59	53	45	61	26.7
12	44	55	45	38	31	45	48	55	39	68	46	55	56	67	50	32.6
13	51	38	59	38	49	41	61	55	33	74	58	38	51	51	46	34.6
14	46	63	54	35	36	50	59	53	39	43	64	59	53	49	44	39.0
15	48	52	68	49	49	36	52	63	27	64	60	47	49	45	42	8.4
16	48	69	54	29	36	52	59	42	43	62	67	47	54	45	40	55.2
17	68	58	59	43	40	43	56	34	51	60	35	32	75	45	50	90.6
18	41	63	66	46	51	59	44	40	35	68	40	47	60	51	42	12.7

APPENDIX E--Continued

A. High Achievers (Male)

Subject	Variables															Composite Score
	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	
19	58	49	49	49	47	36	46	61	45	52	48	45	53	49	64	57.0
20	61	61	52	43	49	43	50	55	43	68	46	36	54	36	57	64.6
21	56	44	45	26	54	52	56	65	37	56	60	47	47	43	57	61.8
22	48	49	54	46	54	27	56	42	45	50	40	59	66	45	70	42.3
23	51	52	55	56	32	52	53	49	47	37	57	51	62	66	66	45.8
24	53	55	66	43	36	59	56	36	35	56	62	47	66	45	35	36.7

B. Low Achievers (Male)

25	39	77	77	38	33	48	48	44	31	64	52	66	60	36	42	10.0
26	34	58	56	46	40	50	44	59	51	60	56	47	51	38	61	27.9
27	56	74	82	32	29	38	48	57	27	58	50	55	58	42	48	38.8
28	58	61	63	49	51	52	40	55	41	50	48	43	53	45	48	50.1
29	51	58	61	57	47	36	46	65	49	56	37	45	51	47	48	43.8
30	56	61	56	46	33	41	57	38	47	56	50	40	64	52	50	59.8
31	39	52	56	38	36	59	46	44	33	66	67	40	70	49	50	13.5
32	51	61	47	52	38	62	48	53	43	62	62	43	47	40	48	38.3
33	36	72	66	38	33	52	50	53	33	54	60	62	70	34	40	8.2
34	53	38	59	49	38	41	32	65	47	66	52	59	39	62	46	51.6

B. Low Achievers (Male)

Subject	Variables															Composite Score
	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	
35	41	52	49	40	29	62	56	48	49	50	69	62	43	49	61	42.6
36	46	36	61	55	42	29	46	42	45	62	54	55	45	60	68	30.1
37	58	66	54	43	42	59	50	65	37	56	48	36	66	34	40	49.0
38	58	69	68	46	29	43	50	44	47	54	44	49	60	40	55	63.3
39	46	61	56	46	51	55	40	44	37	66	52	45	53	49	53	25.0
40	41	47	47	63	47	48	48	61	37	52	50	38	56	47	70	-0.2
41	53	66	73	77	31	41	56	46	41	39	48	49	54	47	55	14.4
42	41	61	63	26	49	41	46	53	47	58	52	49	68	47	37	52.6
43	31	61	59	55	45	36	48	57	55	54	52	57	56	40	46	20.9
44	56	52	56	55	51	55	42	51	47	52	50	49	60	34	46	51.1
45	51	52	59	49	51	34	57	57	39	62	48	38	60	43	48	34.3
46	48	74	70	60	36	38	48	38	37	43	50	45	60	51	59	15.0
47	44	69	73	43	45	55	44	48	27	58	50	49	60	45	46	7.1
48	41	63	71	52	49	50	40	44	37	56	58	53	45	42	55	10.4

C. High Achievers (Female)

49	64	46	56	63	36	39	47	33	56	58	56	48	53	53	42	73.0
50	59	46	52	55	52	37	47	47	53	44	56	50	49	46	50	68.4
51	62	60	54	55	49	54	45	53	58	34	54	58	49	42	49	80.6

APPENDIX E--Continued

C. High Achievers (Female)

Subject	Variables															Composite Score
	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	
52	47	65	56	44	45	47	54	53	41	52	63	50	72	27	38	35.5
53	57	60	56	46	36	29	43	38	47	52	60	52	64	51	55	61.5
54	52	49	54	55	47	37	41	51	58	50	45	41	55	51	64	63.0
55	53	54	70	41	33	49	45	40	45	68	67	50	55	42	36	55.9
56	53	70	52	63	56	27	49	56	52	48	45	41	41	51	51	46.7
57	57	70	72	49	29	44	56	40	39	50	51	43	68	36	49	44.9
58	67	68	61	41	36	61	41	51	32	42	63	52	64	38	40	58.1
59	47	68	63	55	36	39	56	60	41	54	47	45	51	49	42	25.0
60	57	73	63	44	33	32	41	49	43	50	47	54	68	46	51	56.6
61	47	62	49	57	59	54	30	53	45	50	45	50	56	48	49	29.9
62	62	52	68	55	40	39	45	35	37	64	54	48	68	34	51	44.5
63	45	62	61	38	61	54	34	62	41	38	65	41	66	42	42	37.8
64	59	41	43	52	56	56	68	49	54	52	45	31	55	40	51	71.3
65	52	57	59	36	56	54	39	51	52	46	51	41	53	53	49	70.9
66	45	68	65	19	29	59	56	51	38	60	58	43	66	44	47	50.9
67	71	65	59	36	47	39	49	28	56	44	47	58	55	53	42	111.2
68	62	68	65	25	45	32	56	35	54	48	54	43	76	31	55	102.5
69	55	57	65	44	56	47	37	51	47	52	54	37	55	46	51	59.9
70	52	52	63	49	45	49	49	44	50	60	56	45	49	48	62	55.0
71	59	49	56	38	52	44	51	53	43	50	47	39	55	59	51	65.8
72	71	44	47	33	38	39	45	53	60	50	38	48	49	66	62	121.0

D. Low Achievers (Female)

Subject	Variables															Composite Score
	X_1	X_2	X_3	X_4	X_5	X_6	X_7	X_8	X_9	X_{10}	X_{11}	X_{12}	X_{13}	X_{14}	X_{15}	
73	69	57	63	52	59	49	41	47	50	36	42	54	55	42	42	82.0
74	40	65	54	25	38	44	47	44	56	46	35	7	55	59	64	67.3
75	55	52	61	36	42	51	51	44	37	60	76	52	62	27	44	50.4
76	62	62	61	27	47	51	51	42	41	48	45	58	56	42	55	78.3
77	57	46	45	38	54	34	51	47	52	66	56	64	43	34	60	77.8
78	62	57	75	22	52	49	39	49	34	60	56	45	56	40	53	71.0
79	47	57	63	55	47	39	47	60	41	50	40	60	60	38	47	25.0
80	57	54	75	49	40	37	60	44	41	48	49	62	45	48	42	48.3
81	57	44	54	46	54	39	47	58	47	62	58	41	47	46	49	61.5
82	57	68	65	44	45	37	51	49	52	46	49	33	58	46	53	72.0
83	56	49	52	46	52	47	56	53	50	44	31	58	49	57	55	64.9
84	43	54	61	27	52	44	58	47	34	46	60	66	43	49	60	32.8
85	55	57	68	33	45	39	49	38	45	60	45	58	56	34	66	67.1
86	62	52	45	52	61	29	47	44	54	46	49	45	58	48	57	76.6
87	62	60	56	55	40	49	39	53	45	46	54	50	53	44	51	58.2
88	52	54	45	46	33	37	43	51	54	62	54	48	49	51	68	64.8
89	55	54	52	41	39	39	47	42	39	68	65	50	58	61	49	49.1
90	55	60	63	33	45	47	56	33	50	48	42	56	53	59	49	75.7
91	52	52	56	44	40	32	47	49	50	64	40	45	56	44	75	59.8
92	45	35	47	49	49	51	59	60	45	44	56	45	62	53	53	34.1
93	59	49	70	55	52	42	47	47	41	46	45	45	53	48	55	46.1
94	50	49	59	38	56	54	41	56	52	66	33	39	49	51	55	65.5
95	59	52	59	49	61	42	30	47	50	50	45	41	55	53	62	67.3
96	64	44	59	52	54	42	43	53	45	50	47	41	55	49	53	61.6

APPENDIX F

APPENDIX F

T-SCORES AND THE COMPOSITE SCORES DERIVED FROM THE 13 VARIABLES OF THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY FOR 48 HIGH ACHIEVING AND 48 LOW ACHIEVING STUDENTS

A. High Achievers (Male)

Subject	Variables													Composite Score
	X_{16}	X_{17}	X_{18}	X_{19}	X_{20}	X_{21}	X_{22}	X_{23}	X_{24}	X_{25}	X_{26}	X_{27}	X_{28}	
1	43	55	46	54	39	56	55	55	53	40	57	70	46	50.5
2	66	43	64	59	51	47	60	55	41	64	65	65	47	65.6
3	43	68	40	72	92	71	71	67	56	69	74	68	74	17.0
4	40	58	40	41	48	58	76	57	58	54	55	73	41	42.8
5	50	80	51	62	28	44	55	41	62	46	69	53	50	62.7
6	43	46	48	41	32	42	48	61	53	66	71	75	49	35.4
7	40	48	44	41	48	38	46	59	41	46	53	73	50	46.8
8	50	80	46	52	58	38	60	61	50	73	65	63	64	37.7
9	43	60	55	57	60	60	67	67	53	66	63	53	61	43.2
10	50	50	51	57	58	58	67	59	56	44	57	60	53	52.0
11	53	50	49	54	41	49	53	51	38	58	50	65	40	63.9
12	53	43	48	44	53	47	43	59	53	42	38	58	46	63.1
13	46	60	48	59	48	55	67	69	62	89	78	63	56	21.1
14	46	60	48	78	58	40	74	49	53	56	65	60	55	53.4
15	46	55	62	57	48	62	63	69	56	64	67	58	43	46.2
16	46	48	53	54	46	49	71	65	41	46	57	65	48	47.7
17	60	48	38	31	41	55	50	47	50	21	23	75	39	76.2
18	50	53	48	49	46	44	55	59	62	66	57	70	61	48.4

APPENDIX F--Continued

A. High Achievers (Male)

Subject	Variables													Composite Score
	X_{16}	X_{17}	X_{18}	X_{19}	X_{20}	X_{21}	X_{22}	X_{23}	X_{24}	X_{25}	X_{26}	X_{27}	X_{28}	
19	46	80	42	59	75	64	53	59	65	73	92	70	60	14.4
20	50	80	49	69	92	53	57	63	74	71	99	50	63	12.8
21	46	66	42	49	63	58	63	55	70	79	69	73	66	36.5
22	53	46	44	49	36	56	55	39	44	34	44	75	43	76.0
23	50	60	44	67	51	58	84	67	62	64	99	86	50	2.4
24	43	46	36	39	53	60	41	67	38	32	40	53	51	38.5

B. Low Achievers (Male)

25	70	62	64	59	56	51	46	59	38	66	61	55	52	64.3
26	50	80	49	80	46	73	62	51	73	81	88	53	60	34.6
27	40	80	44	59	58	45	57	71	70	73	92	65	66	3.4
28	43	50	57	47	44	49	48	59	47	48	51	58	46	63.7
29	43	76	46	52	60	58	67	63	62	69	80	68	65	23.9
30	40	62	36	36	53	42	64	61	53	56	57	81	56	32.0
31	53	48	51	57	56	49	76	49	44	56	44	50	55	73.1
32	40	60	44	44	44	42	53	55	50	52	65	73	60	42.0
33	46	78	55	70	48	56	53	65	73	69	74	58	60	36.9
34	43	48	48	49	77	49	67	55	41	69	76	63	58	38.2
35	60	60	49	59	84	55	48	59	44	62	63	55	52	45.0

B. Low Achievers (Male)

Subject	Variables													Composite Score
	X_{16}	X_{17}	X_{18}	X_{19}	X_{20}	X_{21}	X_{22}	X_{23}	X_{24}	X_{25}	X_{26}	X_{27}	X_{28}	
36	50	73	48	54	53	58	71	43	59	71	71	68	58	55.4
37	60	70	64	67	68	56	76	59	56	81	96	70	61	37.3
38	66	78	61	54	60	45	53	55	67	56	79	65	54	51.3
39	56	80	46	70	70	65	64	57	65	77	92	65	61	21.3
40	50	58	44	34	41	34	53	57	41	50	53	75	45	49.0
41	56	80	44	65	87	58	64	55	82	73	94	58	61	19.6
42	60	48	55	54	41	48	46	55	47	38	50	73	42	66.6
43	60	68	53	90	72	76	62	71	82	83	88	73	67	17.1
44	40	80	35	41	41	35	64	65	79	86	79	86	52	9.4
45	43	53	44	57	60	60	71	57	59	64	69	83	46	36.7
46	46	62	48	57	46	49	53	59	65	66	59	65	51	46.9
47	50	48	53	57	58	57	57	47	47	48	65	65	51	66.9
48	66	76	51	80	56	55	79	51	82	71	99	88	54	28.5

C. High Achievers (Female)

49	40	50	51	42	46	36	46	45	47	58	51	68	53	72.2
50	40	62	40	48	63	52	76	39	56	73	71	78	67	50.4
51	53	46	53	44	49	42	64	63	50	41	41	58	46	62.3

C. High Achievers (Female)

Subject	Variables													Composite Score
	X_{16}	X_{17}	X_{18}	X_{19}	X_{20}	X_{21}	X_{22}	X_{23}	X_{24}	X_{25}	X_{26}	X_{27}	X_{28}	
52	70	62	48	62	76	73	69	39	59	71	67	68	62	63.0
53	60	64	62	72	61	70	64	60	62	61	66	88	62	56.9
54	40	68	46	76	69	63	50	47	56	73	74	65	67	46.3
55	43	48	55	46	49	52	57	45	53	55	54	38	50	74.6
56	53	53	48	44	51	43	46	47	53	45	53	73	46	65.6
57	63	53	59	48	53	56	64	57	59	46	49	45	48	69.8
58	36	46	53	39	40	43	65	63	30	38	44	68	42	59.9
59	53	48	62	44	40	49	53	57	38	46	55	65	42	68.8
60	56	50	59	42	51	42	57	55	35	45	54	50	45	68.2
61	43	78	33	42	59	38	62	60	76	63	71	81	61	18.8
62	50	50	59	56	53	59	60	45	53	56	58	58	53	76.2
63	43	58	61	50	53	57	76	53	67	65	75	73	47	56.6
64	66	48	72	50	42	57	60	55	53	48	54	70	35	83.6
65	46	60	40	35	40	31	53	39	62	51	57	58	50	61.2
66	56	48	61	44	44	49	55	51	38	46	47	60	45	80.4
67	53	44	57	44	40	49	41	70	38	36	46	58	43	55.3
68	60	48	62	44	44	54	64	43	35	51	51	70	46	87.4
69	53	53	66	54	42	61	55	47	47	58	61	63	40	80.0
70	40	53	40	54	53	63	60	45	56	63	66	78	48	47.6
71	46	60	51	46	51	49	53	53	50	53	49	55	45	64.8
72	43	44	57	46	40	54	57	37	53	50	57	63	46	83.5

APPENDIX F--Continued

D. Low Achievers (Female)

Subject	Variables													Composite Score
	X_{16}	X_{17}	X_{18}	X_{19}	X_{20}	X_{21}	X_{22}	X_{23}	X_{24}	X_{25}	X_{26}	X_{27}	X_{28}	
73	50	62	51	52	55	34	36	72	35	43	57	38	54	37.5
74	62	46	57	50	51	54	48	57	59	48	51	50	50	65.9
75	60	53	53	56	44	57	64	55	50	53	47	50	56	66.5
76	50	62	42	44	53	40	46	59	56	60	67	70	51	33.6
77	50	53	38	44	57	64	57	43	53	51	41	58	55	66.8
78	60	64	46	66	71	66	55	49	62	63	66	53	69	50.3
79	46	62	46	56	51	54	50	55	47	56	77	78	55	35.1
80	56	50	55	54	51	57	64	61	44	45	51	63	45	59.1
81	43	66	49	60	44	57	57	61	62	45	71	65	56	36.6
82	43	48	49	46	49	52	48	53	47	48	54	48	45	58.6
83	53	46	64	50	55	59	62	53	50	55	49	58	44	80.2
84	40	58	46	64	71	56	76	59	59	78	95	81	63	16.8
85	56	48	47	46	55	44	53	66	47	50	49	58	61	44.5
86	60	48	57	54	44	42	55	54	53	65	55	58	47	66.2
87	53	50	59	64	44	49	57	66	44	43	44	60	41	63.7
88	56	70	57	54	55	57	74	74	65	61	74	65	56	29.3
89	50	60	55	48	46	43	48	74	56	61	60	75	46	37.7
90	50	48	44	50	55	57	36	51	44	56	44	50	62	62.6
91	50	53	53	50	55	44	50	54	38	48	61	43	54	56.8
92	40	73	38	36	42	49	64	52	49	66	74	81	52	31.3
93	60	60	66	60	55	57	81	52	65	46	61	53	44	74.4
94	43	70	33	44	61	56	69	52	82	69	71	53	68	27.7
95	46	53	49	46	42	49	55	34	38	46	55	65	47	79.0
96	53	62	46	44	44	42	64	61	53	41	51	65	50	48.5

APPENDIX G

APPENDIX G

T-SCORES AND THE COMPOSITE SCORES DERIVED FROM THE 10 VARIABLES OF THE KUDER PREFERENCE RECORD FOR 48 HIGH-ACHIEVING AND 48 LOW ACHIEVING STUDENTS

A. High Achievers (Male)

Subject	Variables										
	X_{29}	X_{30}	X_{31}	X_{32}	X_{33}	X_{34}	X_{35}	X_{36}	X_{37}	X_{38}	Composite Score
1	33	46	69	41	67	27	50	41	54	59	41.2
2	49	41	50	69	37	45	55	51	54	52	70.0
3	39	65	64	52	43	52	24	56	45	55	22.5
4	33	35	50	47	67	33	74	46	54	63	60.4
5	59	46	58	52	56	58	37	56	54	45	46.2
6	68	51	33	60	43	52	44	46	48	41	46.5
7	44	74	50	47	43	58	74	27	24	55	6.8
8	76	51	50	47	51	52	50	61	40	41	49.5
9	55	56	42	36	67	58	60	51	45	45	23.1
10	49	51	42	47	51	63	64	61	54	38	49.5
11	63	69	42	74	37	58	50	51	33	33	-6.1
12	49	46	58	60	56	39	64	65	45	45	35.5
13	68	46	69	63	39	45	50	41	60	41	62.0
14	55	56	50	52	37	63	50	65	40	30	55.5
15	39	51	58	52	76	39	50	41	45	59	-2.1
16	55	61	58	74	37	45	55	35	54	45	13.7
17	55	51	64	63	43	52	44	61	51	45	42.5

APPENDIX G--Continued

A. High Achievers (Male)

Subject	Variables										Composite Score
	X_{29}	X_{30}	X_{31}	X_{32}	X_{33}	X_{34}	X_{35}	X_{36}	X_{37}	X_{38}	
18	44	65	42	57	67	27	60	46	45	49	-27.3
19	59	56	42	52	51	52	31	41	45	30	30.4
20	63	56	50	52	51	45	44	61	48	52	30.4
21	63	61	42	41	56	52	44	51	45	41	23.7
22	33	51	76	52	71	39	60	46	33	63	6.9
23	49	61	50	47	62	52	55	51	33	49	4.9
24	55	41	50	60	51	45	50	51	69	38	56.9

B. Low Achievers (Male)

25	63	56	42	57	43	63	55	46	54	41	38.1
26	39	56	58	47	51	45	37	56	40	55	37.1
27	49	56	50	57	67	52	44	41	69	35	-5.0
28	49	65	50	60	51	45	44	56	48	38	-2.6
29	63	61	50	57	62	52	55	51	40	41	-8.4
30	55	56	50	57	56	52	37	51	45	41	14.7
31	44	51	42	47	56	45	44	46	45	49	40.5
32	55	61	58	57	56	45	50	51	45	49	2.4
33	49	56	42	41	43	63	60	51	37	41	59.5

B. Low Achievers (Male)

Subject	Variables										Composite Score
	X_{29}	X_{30}	X_{31}	X_{32}	X_{33}	X_{34}	X_{35}	X_{36}	X_{37}	X_{38}	
34	39	56	50	41	51	68	37	56	54	45	45.1
35	44	65	50	41	65	58	60	35	45	52	-2.3
36	59	51	50	52	43	68	44	56	40	41	57.2
37	55	56	33	52	65	52	50	41	33	45	5.3
38	44	46	50	60	56	39	37	46	45	59	35.5
39	55	61	50	47	56	52	37	56	45	52	15.7
40	49	51	50	47	62	58	55	46	40	49	29.7
41	55	51	42	52	56	45	44	56	48	41	33.8
42	63	74	33	57	37	68	44	27	40	24	4.3
43	44	56	42	41	56	45	60	69	54	55	36.1
44	49	61	50	58	37	39	37	76	61	35	21.8
45	59	68	64	52	51	52	44	56	33	38	0.7
46	55	51	64	63	51	63	50	46	45	52	28.1
47	33	51	58	52	56	52	50	65	37	59	33.8
48	44	56	69	52	51	39	55	61	54	45	30.4

C. High Achievers (Female)

49	55	51	42	57	30	68	44	35	57	49	73.8
50	44	41	58	52	51	58	50	56	57	49	67.6
51	49	46	50	42	43	39	50	65	54	55	82.9
52	49	51	42	41	30	52	44	51	61	45	95.2

APPENDIX G--Continued

C. High Achievers (Female)

Subject	Variables										Composite Score
	X_{29}	X_{30}	X_{31}	X_{32}	X_{33}	X_{34}	X_{35}	X_{36}	X_{37}	X_{38}	
53	44	46	58	68	43	52	50	41	54	38	48.2
54	63	51	58	47	51	45	44	41	54	49	49.5
55	49	35	33	41	43	58	60	46	60	55	111.5
56	55	51	58	47	51	68	44	46	51	45	49.5
57	39	35	33	47	56	45	55	35	57	66	80.1
58	24	51	50	59	43	39	74	35	60	49	47.8
59	33	35	42	47	43	52	64	35	57	59	103.5
60	49	41	64	60	37	52	50	65	48	45	82.0
61	39	35	50	41	43	52	55	61	51	59	111.5
62	49	41	58	47	43	52	55	65	60	49	88.6
63	68	51	42	47	51	45	55	35	37	52	49.5
64	55	61	50	63	37	45	44	35	69	33	28.4
65	44	41	50	54	37	58	50	46	61	63	90.0
66	39	35	58	52	43	33	64	51	69	59	96.8
67	49	41	58	57	43	76	50	51	37	45	75.3
68	49	41	69	68	37	52	37	56	76	41	71.3
69	39	35	64	41	24	39	69	46	57	59	145.6
70	49	41	42	31	51	58	44	41	61	45	95.6
71	49	56	50	63	43	52	44	46	60	41	30.1
72	35	35	50	41	51	33	60	46	57	59	97.1

D. Low Achievers (Female)

Subject	Variables										
	X_{29}	X_{30}	X_{31}	X_{32}	X_{33}	X_{34}	X_{35}	X_{36}	X_{37}	X_{38}	Composite Score
73	55	24	42	47	51	39	50	56	51	69	116.4
74	55	46	42	47	43	39	44	51	61	45	76.2
75	55	56	50	52	43	45	50	56	48	49	44.8
76	44	35	50	60	56	52	50	51	48	53	62.8
77	44	46	24	36	62	33	60	35	60	55	56.8
78	55	41	42	31	56	52	60	51	45	66	86.7
79	33	46	50	57	37	58	55	51	60	55	73.6
80	39	41	58	41	43	52	55	69	37	71	96.6
81	49	51	42	36	51	45	55	51	45	66	64.2
82	59	56	42	52	56	39	64	51	45	49	21.4
83	44	41	50	36	56	39	37	46	57	76	80.0
84	55	51	50	60	56	45	44	51	51	55	23.1
85	44	46	33	31	56	58	44	61	45	59	74.3
86	55	46	64	60	43	52	64	35	40	59	58.9
87	39	46	42	52	51	68	60	51	51	52	55.2
88	68	46	58	24	43	58	44	69	40	59	107.0
89	49	41	58	52	43	45	55	41	51	66	81.9
90	44	24	50	41	62	39	69	56	60	49	104.7
91	49	41	42	47	56	52	44	46	57	49	65.3
92	39	46	42	47	50	36	64	46	57	55	63.7
93	55	65	42	47	51	58	44	56	33	45	14.8
94	63	51	50	36	56	52	31	61	54	52	55.2
95	33	41	58	47	62	45	50	46	61	49	54.5
96	39	35	58	52	43	45	44	51	51	63	96.8

APPENDIX H

APPENDIX H

INTERCORRELATIONS AMONG EDWARDS PERSONAL PREFERENCE SCHEDULE VARIABLES WITH SUBJECTS COMBINED (N=96)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Achievement		-108	-075	081	189	-256	-086	-213	279	-306	-268	-203	-013	-031	007
2. Deference			434	-117	-356	066	009	-268	-203	-115	-047	125	406	-302	-325
3. Order				-119	-269	-026	-022	-348	-428	119	000	135	335	-188	-322
4. Exhibition					144	-252	-149	107	214	-230	-227	-175	-213	004	132
5. Autonomy						-007	-257	243	206	-253	-277	-210	-236	-002	139
6. Affiliation							-099	162	-284	005	390	-112	027	-194	-373
7. Intraception								-210	-162	-003	027	059	124	-072	-016
8. Succorance									-026	-046	048	-198	-389	-057	-001
9. Dominance										-196	-362	-008	-294	133	274
10. Abasement											155	-183	068	-010	-098
11. Nurturance												021	009	-246	-320

APPENDIX H--Continued

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
12. Change													-178	100	022
13. Endurance														-296	-266
14. Heterosexuality															181
15. Aggression															

Note.-Decimal points have been omitted

APPENDIX I

APPENDIX I

INTERCORRELATIONS AMONG MINNESOTA MULTIPHASIC PERSONALITY INVENTORY VARIABLES WITH SUBJECTS COMBINED (N=96)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Lie		-071	532	266	104	193	-021	-061	-031	-076	-094	-175	-295
2. Validity			-320	450	397	146	302	187	717	604	781	217	216
3. K				211	-173	105	014	041	-273	-120	-127	-289	-261
4. Hypochondriasis					493	572	327	133	428	542	607	-009	-159
5. Depression						434	259	142	343	542	514	-062	-053
6. Hysteria							323	-071	304	334	276	019	-115
7. Psychopathic Deviate								-014	386	389	430	307	-234
8. Masculinity-Femininity									107	119	201	020	-197
9. Paranoia										577	662	245	-253
10. Psychastenia											787	206	-303
11. Schizophrenia												314	-192
12. Hypomania													-164
13. Social I. E.													

Note.-Decimal points have been omitted.

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APPENDIX J

APPENDIX J

INTERCORRELATIONS AMONG KUDER PREFERENCE RECORD VARIABLES WITH SUBJECTS COMBINED (N=96)

Variable	1	2	3	4	5	6	7	8	9	10
1. Outdoor		341	-163	124	-141	291	-341	075	-229	-482
2. Mechanical			-071	232	054	216	-243	-085	-472	-533
3. Computational				282	-082	-116	-075	200	016	010
4. Scientific					-289	010	-107	-124	089	-445
5. Persuasive						-285	074	-059	-219	178
6. Artistic							-228	031	-255	-351
7. Literary								-228	-035	-271
8. Musical									-067	-013
9. Social Service										-011
10. Clerical										

Note.-Decimal points have been omitted.

APPENDIX K

APPENDIX K

COMPOSITE SCORES DERIVED BY PARTIAL REGRESSION ANALYSIS OF T-SCORES OBTAINED ON THE EDWARDS PERSONAL PREFERENCE SCHEDULE (EPPS) MINNESOTA MULTIPHASIC PERSONALITY INVENTORY (MMPI) AND KUDER PREFERENCE RECORD (KPR)

Subject	High Achievers						Low Achievers					
	Male			Female			Male			Female		
	EPPS	MMPI	KPR	EPPS	MMPI	KPR	EPPS	MMPI	KPR	EPPS	MMPI	KPR
1	82.1	50.5	41.2	73.0	72.2	73.8	10.0	64.3	38.1	82.0	37.5	116.4
2	17.7	65.6	70.0	68.4	50.4	67.6	27.9	34.6	37.1	67.3	65.9	76.2
3	59.2	17.0	22.5	80.6	62.3	82.9	38.8	3.4	-5.0	50.4	66.5	44.8
4	65.3	42.8	60.4	35.5	63.0	95.2	50.1	63.7	-2.6	78.3	33.6	62.8
5	41.2	62.7	46.2	61.5	56.9	48.2	43.8	23.9	-8.4	77.8	66.8	56.8
6	3.2	35.4	46.5	63.0	46.3	49.5	59.8	32.0	14.7	71.0	50.3	86.7
7	49.6	46.8	6.8	55.9	74.6	111.5	13.5	73.1	40.5	25.0	35.1	73.6
8	44.7	37.7	49.5	46.7	65.6	49.5	38.3	42.0	2.4	48.3	59.1	96.6
9	95.5	43.2	23.1	44.9	69.8	80.1	8.2	36.9	59.5	61.5	36.6	64.2
10	25.9	52.0	49.5	58.1	59.9	47.8	51.6	38.2	45.1	72.0	58.6	21.4

APPENDIX K--Continued

Subject	High Achievers						Low Achievers					
	Male			Female			Male			Female		
	EPPS	MMPI	KPR	EPPS	MMPI	KPR	EPPS	MMPI	KPR	EPPS	MMPI	KPR
11	26.7	63.9	-6.1	25.0	68.8	103.5	42.6	45.0	-2.3	64.9	80.2	80.0
12	32.6	63.1	35.5	56.6	68.2	82.0	30.1	55.4	57.2	32.8	16.8	23.1
13	34.6	21.1	62.0	29.9	18.8	111.5	49.0	37.3	5.3	67.1	44.5	74.3
14	39.0	53.4	55.5	44.5	76.2	88.6	63.3	51.3	35.5	76.6	66.2	58.9
15	8.4	46.2	-2.1	37.8	56.6	49.5	25.0	21.3	15.7	58.2	63.7	55.2
16	55.2	47.7	13.7	71.3	83.6	28.4	-0.2	49.0	29.7	64.8	29.3	107.0
17	90.6	76.2	42.5	70.9	61.2	90.0	14.4	19.6	33.8	49.1	37.7	81.9
18	12.7	48.4	-27.3	50.9	80.4	96.8	52.6	66.6	4.3	75.7	62.6	104.7
19	57.0	14.4	30.4	111.2	55.3	75.3	20.9	17.1	36.1	59.8	56.8	65.3
20	64.6	12.8	30.4	102.5	87.4	71.3	51.1	9.4	21.8	34.1	31.3	63.7
21	61.8	36.5	23.7	59.9	80.0	145.6	34.3	36.7	0.7	46.1	74.4	14.8
22	42.3	76.0	6.9	55.0	47.6	95.6	15.0	46.9	28.1	65.5	27.7	55.2
23	45.8	2.4	4.9	65.8	64.8	30.1	7.1	66.9	33.8	67.3	79.0	54.5
24	36.7	38.5	56.9	121.0	83.5	97.1	10.4	28.5	30.4	64.6	48.5	96.8