

THE IDENTIFICATION OF CERTAIN CHARACTERISTICS
OF SELECTED ACHIEVERS AND UNDERACHIEVERS
OF BELLAIRE SENIOR HIGH SCHOOL

A Dissertation
Presented to
the Faculty of the College of Education
University of Houston

In Partial Fulfillment
of the Requirements for the Degree
Doctor of Education

by
LaVerne Carmical
August 1961

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The purpose of this investigation was to study certain characteristics of Bellaire junior and senior students designated as achievers and underachievers within the Otis Intelligence Score range of 110-125. Selection of the members of the groups was limited to those pupils whose scholastic ranks were within the class level of 5.0-4.5 or 2.9-2.0. In the light of the findings the intent was to identify the scholastic aptitudes, the vocational preferences, the values, and the temperament traits of the achievers and the underachievers.

The intelligence scores and the class level ranks were obtained from the school records. Scores which resulted from the administration of the Differential Aptitude Tests, the Kuder Preference Record--Vocational, the Allport-Vernon Study of Values, and the Thurstone Temperament Schedule provided data for the comparative study of the two groups. The mean scores, the extreme scores, and the distributions of percentages were examined to determine whether differences existed between the achievers and the underachievers, and to present the basis for a description for each group.

Significant differences were found in the scholastic aptitudes. The achievers evidenced high abilities in verbal

and numerical areas; whereas the underachievers were adept in spatial and mechanical concepts. No apparent difference existed between the two groups in the aptitude related to logical reasoning.

Achievers and underachievers appeared not to differ significantly in vocational preference, nor could either group be characterized by a specific occupational interest. Both groups placed high worth on the religious value and could be described as high in reflective and low in impulsive temperament traits. The underachievers were found to be active and vigorous in temperament; the achievers were discovered to be high in theoretical and social traits.

The conclusions resulting from this study indicated that the underachievers possessed abilities that entitled them to special counseling, challenging curricula, and the encouragement that would guide them toward productive academic performance. Large percentages of both groups were found to be potentially able to do college work.

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This dissertation came into being and to its ultimate conclusion largely because of the encouragement and assistance of many persons to whom this writer should like to convey appreciation.

Dr. William J. Yost, Chairman of the Research Committee, has been particularly helpful with his constructive guidance and clear judgments of the approach to and development of the problem. Special thanks are expressed to the members of the Research Committee, Doctors Harper F. Beaty, Lawrence E. Freeman, Wallace H. Strevell, and James R. Lent, for timely suggestions and judicious advice. The writer is especially indebted to Dr. Arvin N. Donner for his interest and encouragement, to Dr. Frank L. Stovall for his assistance in test selection and scoring, and to Mr. Charles S. White for providing the first inspiration for this study.

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CHAPTER I

THE PROBLEM AND DEFINITION OF TERMS USED

One of education's greatest enigmas has been academic achievement; consequently, when an exploration has been attempted into any facet of this phase of a student's life, interest has proved to be widespread. Although many claims have been made as to the causes of underachievement and methods for the prediction of achievement have been developed, there appeared to be a need for the study of selected characteristics of a sample of today's youth who have or have not achieved in their school situation.

I. THE PROBLEM

Statement of the problem. The purpose of this investigation was to study two groups of junior and senior pupils of a large city high school. The primary concern was to determine whether "achievers" and "underachievers" of a recorded Otis Intelligence Quotient varied in their scores in scholastic aptitudes, vocational preferences, values, and temperament traits as measured by valid, reliable instruments.

Importance of the study. Scholastic achievement has been one of the most important goals of education. For every student to perform to the extent of his abilities has

been the aim of parents and teachers. In reality too many able students have fallen short. The most common approach to the study of the problem has been to focus attention on the relationship of intelligence and achievement.

Researchers in the last two decades have begun to delve into personality traits and other factors which may influence the learner.

As a result of interest in and emphasis on variance of scholastic achievement and intelligence scores derived from a group test measurement, a need to narrow this investigation to the characteristics of a limited sampling of achievers and underachievers in Bellaire Senior High School in Bellaire, Texas, was judged to be of importance. In the school during the academic year 1960-1961 there was an overall failure of thirty per cent. Reports of failures of individual junior and senior pupils revealed that eight per cent of the failures were in the Otis Intelligence Quotient range of 110-125. This study identified the junior and senior achievers and underachievers in the indicated intelligence span for the descriptive analysis. The initial phase was to identify scholastic aptitudes, vocational preferences, values, and temperament traits of the two groups. Although this approach was to a degree narrowed in scope, factors associated with the individual and with the

achievers and underachievers were considered to be of some significance.

In discussing research needed in education, R. M. Hall of the United States Office of Education recently said:

What are the unique abilities of students? This is a fertile field for research. . . . There is a need to keep uppermost in our minds the development of the individual, assuming that if we help him develop fully, he will be a competent, effective member of a highly complex free society.¹

This research, with attention pointed toward the special characteristics of the individual and toward the two sample groups, provided the greatest value to the young people involved in the study; second in importance was the use of the results by the parents and teachers of the students.

Limitations of the study. The limitations of this study were within the analysis of certain characteristics of two groups of Bellaire Senior High School students. The students of the two groups were within the junior and senior class level ranks of 5.0-4.5 or 2.9-2.0 and the Otis Intelligence Quotient range of 110-125. Although the findings of this investigation were of major concern to all persons who work with students of above average intelligence, the study itself did not propose to recommend means of

¹R. M. Hall, "Research Needed in Education," School Review, 42:8, March, 1960.

promoting achievement. Another study would be necessary for such propositions.

Because of the nature of the situation, students were at liberty to accept or reject the program offered to them. The analysis had to be limited to those students who chose to accept the offer to participate. Further limitation of the study resulted from the exact number of instruments selected to appraise the characteristics of the pupils. This treatise has been specifically directed toward what the characteristics of the achievers and underachievers were and the variability of these characteristics of the study groups. There was no attempt to discover why these characteristics existed, as such, or how they could be controlled.

II. EXPERIMENTAL DESIGN

Selection of the sample. On a five-point system the students of Bellaire Senior High School were ranked at the junior level and at the senior level for the academic years composed of two semesters each. The scholastic rank for the junior students included five semesters; the scholastic rank for the senior students included seven semesters. The members of the experimental groups were within the class level rank of 5.0-4.5 or 2.9-2.0; the Otis Intelligence Quotient of each individual fell within 110-125. (See Table I, page 5.)

TABLE I
DISTRIBUTION OF OTIS INTELLIGENCE SCORES

Scores	Achiever	Underachiever
125	44	4
122 - 124	30	5
119 - 121	17	16
116 - 118	19	12
113 - 115	8	14
110 - 112	14	25
Total	132	76
Mean	119.6	114.6

In September, 1960, there were 1,553 pupils enrolled in the combined junior and senior classes at Bellaire Senior High School. The two extremes of the class level ranks were examined to locate the students whose averages were between the designated limits. The names were matched with the Otis Intelligence Quotient scores recorded on the permanent record cards in the school registrar's office. When a student met both limiting factors, he was presented with a letter which indicated the selection for the study and which required his parents' signatures of consent for participation in a series of tests to be administered at the school.

The achievers numbered one hundred ninety-two pupils, or twelve per cent of the total number of junior and senior students; the underachievers numbered one hundred twenty-seven pupils, or eight per cent of the total number in the consideration. Of the one hundred ninety-two achievers, sixty-eight per cent (one hundred thirty-two pupils) replied that they wished to be participants. The percentage of acceptance from the underachievers was fifty-nine (seventy-six pupils). For the achievers who began the series, ninety-one per cent completed the tests; for the underachievers, eighty-three per cent. (See Table II, page 7.)

Data. To analyze the characteristics, the variables of the scholastic aptitudes, preferences, values, and

TABLE II
POPULATION SELECTED, PARTICIPATING IN PROGRAM,
AND COMPLETING ALL TESTS

Item	Achievers		Underachievers	
	Number	Percentage	Number	Percentage
Selected	192	12.3	127	8.5
Participated	132	68.7	76	59.7
Completed All Tests	113	85.6	61	83.3

temperaments of the sampling were selected. To insure a realistic measure, the instruments utilized were chosen on the basis of reliability and validity. The instruments of measure which were administered to the students were: Differential Aptitude Tests; Kuder Preference Record-- Vocational; Allport-Vernon Study of Values; and the Thurstone Temperament Schedule.

Method. In March, 1961, a schedule was prepared and distributed to the participating students. Because of the fact that these young people were engaged in many and varied activities, they were provided with a flexible testing schedule. The tests were administered during the month of March. The Differential Aptitude Tests and the Kuder Preference Record were machine-scored by the University of Houston Testing Service. The Allport-Vernon Study of Values and the Thurstone Temperament Schedule were hand-scored.

For each sub-test of the Differential Aptitude Tests which were administered, a frequency distribution table was prepared for the achiever group and for the underachiever group. The means and standard deviations were computed. Since "t" is the significant ratio which is used to determine the probability of the obtained difference's being

larger than chance,² this test was applied to the results of each sub-test.

The scores for each area of interest of the Kuder Preference Record were recorded in rank order. The emphasis was placed on the percentage of achievers and under-achievers at or above the ninetieth percentile, the fiftieth percentile, and below the tenth percentile. Range of distribution of scores was reported.

The results of the Allport-Vernon Study of Values were computed in percentage of scores which fell above or below eighty-two per cent of all scores; also computed were percentages of scores which fell above or below fifty per cent of all scores. The comparative percentages of the two experimental groups were presented in tables. Graphically depicted were the mean scores of the achievers and the underachievers.

To study the frequency distribution of each of the traits of the Thurstone Temperament Schedule, tables and histograms were prepared for the achiever and underachiever samples. The histograms were so constructed that each could be analyzed separately or that the histogram representing the underachiever could be placed over that histogram representing the achiever to enable comparative study.

²J. Francis Rummel, An Introduction to Research Procedure in Education (New York: Harper and Brothers, 1958), p. 198.

III. DEFINITIONS OF TERMS USED

Achiever. A student whose scholastic rank for his grade level for the term ending January, 1961, was within 5.0-4.5 and whose recorded Otis Intelligence Quotient was within 110-125 was called an "achiever."

Underachiever. A student whose scholastic rank for his grade level for the term ending January, 1961, was within 2.9-2.0 and whose recorded Otis Intelligence Quotient was within 110-125 was called an "underachiever."

Characteristic. A scholastic aptitude, a vocational preference, a value, or a temperament trait was called a characteristic.

IV. ORGANIZATION

This thesis was organized into seven chapters. Chapter one presented the problem and its implications; chapter two was a review of the related literature; chapter three summarized the purposes of the Differential Aptitude Tests and presented an analysis of the results of the tests administered; chapter four was concerned with explanation of areas of interest for which students could indicate a vocational preference and the comparative percentages of the two groups; chapter five presented the six values of the Allport

Vernon Study of Values and that which they purport to represent, and reported frequency distributions and extreme scores of the achievers and the underachievers; chapter six was devoted to traits of temperament as illustrated by the Thurstone Temperament Schedule and provided a comparative picture of the experimental groups; chapter seven was composed of a summary of the investigation and its findings, a presentation of the conclusions, and a recommendation for continued research in underachievement as it is related to the characteristics of the able individual who has not achieved in his school situation.

CHAPTER II

REVIEW OF THE LITERATURE RELATED TO THE CHARACTERISTICS STUDIED

Of consuming interest and tireless study has been the problem of scholastic underachievement. Until recent years primary concern had been with correlation of intelligence and academic success. Focus now has turned to aptitudes and fringe factors of causation. Conferences, lectures, symposiums, Parent-Teacher Association meetings, and school study groups have engaged in the search for an understanding of the underachievers of the above average ability.

The 1958 National Education Association Conference, basically oriented toward the academically talented--that approximately two per cent of the high school population frequently called the "gifted"--eventually included study of the larger per cent of the able high school students who should be going to college to become the professional leaders in fields other than those of the highly specialized scientist and engineer. Some youth, it was concluded, have considerable ability but do not achieve well in school, or they fail to hit their academic stride late in their high school

experience.¹ Recommended were adequate tests with interpretation for self-understanding to give meaning to the scores.

In Project Talent, financed by the United States Office of Education, Flanagan and Dailey reported data collected on 1,200 school children in grades 9-12 for the basic purpose of making a national census of resources of American youth.² H. G. Gough reported in 1955 that "Achievement among gifted persons is a specific facet of the general problem of socialization. . . ."³

The literature is rich with reports of studies which have attempted to correlate one or many student characteristics with achievement. Claims have been made as to the use of tests and inventories to counsel students. To study aptitudes is frequently the first phase.

¹"The Identification of Education of the Academically Talented Student in the American Secondary School," The Conference Report, James B. Conant, Chairman, National Education Association Conference (Washington: National Education Association, 1958), p. 16.

²John C. Flanagan and John T. Dailey, "Project Talent --The Identification, Development, and Utilization of Human Talents," Personnel and Guidance Journal, 38:504, February, 1960.

³H. G. Gough, "Factors Related to Differential Achievement Among Gifted Persons," Report of the American Psychological Association (San Francisco: American Psychological Association, 1955), p. 325.

I. APTITUDES AND ACHIEVEMENT

Scholastic aptitude tests have been developed to predict achievement and to identify abilities of pupils. The Differential Aptitude Tests were launched in 1947 with the hope that they might make a significant contribution. Differential Aptitude Tests scores have been correlated with scores on several intelligence tests, interest inventories, aptitude and achievement tests.

A study by Doppelt and Bennett found considerable constancy of performance between ninth- and twelfth-grade performance of high school students given the Differential Aptitude Tests.⁴ A consistent and significant relationship between the Differential Aptitude Test of Mechanical Reasoning and the Kuder Mechanical and Science Interest held, but for boys only. Other pairings did not prove to be significant. The Psychological Corporation presented an analysis of about 1,400 boys and about 1,700 girls who took the Differential Aptitude Tests in the ninth grade to clarify how the tests could be used to discover the able underachiever. "All too often latent abilities of a pupil are overlooked."⁵

⁴J. E. Doppelt and G. K. Bennett, "A Longitudinal Study of the D. A. T.," Educational and Psychological Measurement, 11:228-237, Summer, 1951.

⁵The Psychological Corporation, Test Service Bulletin, No. 41, May, 1951, p. 5.

The Differential Aptitude Tests have proved helpful to counselors, employers, and curriculum researchers. The students of the unachieving bracket have been bolstered by high scores on the Differential Aptitude Tests.

In present-day practices the trend toward predicting achievement has become closely allied with scholastic aptitude tests. The feeling has developed so strongly that many colleges have tested all applicants in the areas of linguistic and quantitative, and have admitted some students whose scholastic aptitudes were higher than their scholastic achievement. This action was based on the same belief that Shirley Wedeen expressed when she said that an aptitude test really measures achievement potential in a specific area.⁶ The Psychological Corporation in proclaiming a need for the Differential Aptitude Tests in the senior high school program stated that an aptitude inventory provided the facts about individual differences to aid in lowering waste of human resources. Their research indicated that Verbal Reasoning, Numerical Ability, and Language Usage tests were consistently good predictors of academic success for those individuals who scored above the fortieth percentile.⁷ In 1952 Wesman in a

⁶ Shirley Ullman Wedeen, "Uses and Misuses of Aptitude Tests," The Clearing House, 35:11-12, September, 1960.

⁷ The Psychological Corporation, loc. cit.

summary of A Five Year Report on the Differential Aptitude Tests concluded: "The tests can be useful in predicting the student's progress and can provide significant details for an inventory of the student's strengths and weaknesses in some important traits."⁸ Calia in the 1960 report of his prediction studies emphasized that verbal aptitude constituted the requisite for learning and that the absence of language skills did not act as a detriment to success in academic subjects.⁹

Another approach to the field of underachievement has appeared frequently in the literature. Such investigators have directly compared the achiever and the underachiever in aptitude and achievement. Calling the study groups "probationary" and "non-probationary" students, DeRidder at the University of Illinois found the difference between the mean scores on the American Council on Education Psychological Examination and the mean scores on grade points to be significant at the one per cent level of confidence. (Fisher "t" = 4.90.)¹⁰ In California, at Chico State College, Shaw

⁸Alexander G. Wesman, "The Differential Aptitude Tests," Personnel and Guidance Journal, 31:167, December, 1952.

⁹Vincent F. Calia, "Use of Discriminant Analysis in the Prediction of School Performance," Personnel and Guidance Journal, 39:186, November, 1960.

¹⁰Lawrence M. DeRidder, "Relation Between Gross Scores on the ACE and Academic Success," Journal of Educational Research, 46:356, January, 1953.

and Brown focused attention on bright college students who were underachieving. The control and study groups were composed of students whose ACE scores placed them at or above the seventy-fifth percentile. The grade-point average was significant at the one per cent level of confidence. On the Cooperative Achievement Tests, Form Y, comparison through use of the "F" and "t" tests revealed no significant difference between the two groups.¹¹

Within the last two years three parallel studies have indicated similar results. Concentrating on high school boys, Frankel used the Differential Aptitude Test results to compare the achievers with the underachievers. In his investigation he directly stated: "The achievers have significantly greater aptitudes than the underachievers in the verbal and mathematic areas."¹² At the University of Arkansas, Diener's group of underachieving males scored lower in their scholastic aptitudes, reading ability, mechanics of expression, and average number of study hours. At the five per cent level, "t" ratios favored the overachiever in

¹¹Shaw and Brown, "Scholastic Underachievers of Bright College Students," Personnel and Guidance Journal, 36:196, November, 1957.

¹²Edward Frankel, "A Comparative Study of Achieving and Underachieving High School Boys of High Intellectual Ability," Journal of Educational Research, 53:172, January, 1960.

cumulative average, high school marks, and study habits.¹³ Schwillick studied high school freshmen and found academic achievement directly related to scholastic aptitude. He further stated that factors other than ability and academic load were important in predicting achievement.¹⁴

II. PREFERENCES AND ACHIEVEMENT

Closely following aptitudes the research has presented many investigations with interests and preferences as the subject. The results and conclusions varied to a degree. Frandsen and Sessions devised a method of inter-correlations between interests and achievements, the mean correlation being 2.7, with school children. In their words certain students may be motivated to some extent by interests while others are more highly motivated by extrinsic motives.¹⁵ Frandsen's high school study revealed that between Scientific Interest as measured by the Kuder Preference Record, and long-range achievement in science as measured by the General

¹³C. L. Diener, "Similarities and Differences Between Overachieving and Underachieving Students," Personnel and Guidance Journal, 38:396, January, 1960.

¹⁴Gene L. Schwillick, "Academic Achievement of Freshmen High School Students in Relationship to Class Load and Scholastic Aptitude," Personnel and Guidance Journal, 38:455-456, February, 1959.

¹⁵Arden N. Frandsen and Alwyn D. Sessions, "Interests and School Achievement," Educational and Psychological Measurement, 23:95, Spring, 1953.

Educational Development Test, there existed a correlation of .50.¹⁶ Also, at the high school level Hill and Rogge tried to relate Kuder Preference Record Scores to Mental Maturity Scores. They reported a low correlation at the five per cent level of confidence of literary interest with intelligence quotients of boys. The instrument of measurement for intelligence quotient scores was the California Test of Mental Maturity, S-Form.¹⁷

Comparing achieving and non-achieving students of high ability Henry Morgan found no significant difference in variety of well-developed interests on the Strong Interest Blank. He reported:

Significantly more achievers than nonachievers had interests typical of persons in social service or welfare occupations, while more nonachievers had interests typical of persons in business detail occupations and business sales occupations. Achievers scored higher than nonachievers on a scale of Interest Maturity.¹⁸

Frankel's underachieving high school boys scored Kuder interests significantly greater in mechanical and artistic

¹⁶Arden Frandsen, "Interest and General Educational Development," Journal of Applied Psychology, 31:62, February, 1947.

¹⁷George E. Hill and Harold Rogge, "The Relation of Kuder Preference Record to Mental Maturity Scores in High School," Journal of Educational Research, 51:546-547, March, 1958.

¹⁸Henry A. Morgan, "A Psychometric Comparison of Achieving and Nonachieving Students of High Ability," Journal of Counseling Psychology, 16:292-298, June, 1952.

areas than the achievers did; however, the achievers led in scientific and computational interests.¹⁹

Interest patterns provided the theme for Stewart to reveal findings about the interests of a high-ability, high-achieving group of two hundred thirty women and six hundred twelve men. In comparing the selective group with a more representative sample of 1959 college students, he indicated that the ability group was less intense, i.e., they had fewer primary and reject patterns than those of the control group.²⁰ In an earlier study in 1957 Stewart had delved into the question of whether knowledge of performance on an aptitude test would change scores on the Kuder. With experimental and control groups, his data showed no significant changes resulting from the order of administration of the tests. There was a remarkable stability in Kuder scores made before and after knowledge of performance on aptitude tests.²¹

¹⁹Frankel, loc. cit.

²⁰Lawrence H. Stewart, "Interest Patterns of a Group of High Ability, High Achieving Students," Journal of Counseling Psychology, 6:132-133, Summer, 1959.

²¹Lawrence H. Stewart, "Does Knowledge of Performance on an Aptitude Test Change Scores on the Kuder Preference Record," Journal of Counseling Psychology, 4:163-164, Summer, 1957.

At the University of Minnesota, Vivian H. Hewer checked into the intercorrelations of vocational interests, achievement, and ability of pre-medical students. The results showed no correlation between those students with similar interests and those with dissimilar interests in relation to achievement. There was, however, a significant difference at the five per cent level in relation to honor points.²²

Another reference to Wesman's report on the Differential Aptitude Tests provided the information that there was a consistent and significant relationship between DAT Mechanical Reasoning and Kuder Mechanical and Science Interest; this held for boys only. Others did not prove significant.²³ Because Rose Anderson, Director of The Psychological Service Center, New York City, realized keenly that high school students often confused preferences on an interest scale with aptitudes, she compiled data on male clients at the Center. These men, eighteen years and older, were given ACE, the Minnesota Clerical Test, and the Benreuter Personality Inventory. Comparative measures indicated a positive relationship between the clerical aptitude test and

²²Vivian H. Hewer, "Vocational Interests, Achievement, and Ability Intercorrelation at the College Level," Journal of Counseling Psychology, 4:234-238, Fall, 1957.

²³Wesman, op. cit., p. 168.

the combined arithmetic tests of ACE. Then, appreciably significant was the relationship between clerical preference and percentiles for self-sufficiency and social dominance on the personality inventory. Low correlations between the Kuder Computational preferences and the ACE arithmetic strikingly indicated that aptitudes related to interest could not be assumed.²⁴

III. VALUES AND ACHIEVEMENT

Pursuing another individual characteristic which evidenced influence on achievement showed the relationship of values. Vernon and Allport in 1931 developed scales for generalized values. Since that time these scales have been widely used. Stagner felt that the validity of such a subjective measure as the Study of Values would be difficult. To illustrate his concept that testing groups that had already indicated relative dominance of particular value attitudes would provide the best evidence, he summarized a study of the psychology faculty of Dartmouth College. A composite profile revealed very high scores on theoretical, aesthetic, and social values, and very low rankings on political and economic responses. The comparative group was

²⁴Rose G. Anderson, "Do Aptitudes Support Interests," Personnel and Guidance Journal, 32:14-17, September, 1953.

Dartmouth undergraduate men and Wellsley undergraduate women whose values showed the characteristic sex differences of high on economic and political values for men and high on aesthetic and religious values for women.²⁵

Using the Study of Values as one of several instruments of measure of bright underachieving college students Shaw and Brown found no significant difference between the experimental and the control groups on the six scales.²⁶

Using Osgood's modified form of the Semantic Differential for measuring values, Winter produced an interesting study of values and achievement of freshmen psychology students. He tried to relate values of students and teachers. He accepted his hypothesis that the higher the relationship between values of students and teachers the higher was the achievement of that student in that teacher's class.²⁷

In looking at personal values and achievement in college, Marilyn Heilfron asked: "Is lack of achievement a function of believing in the wrong values or believing in the

²⁵Ross Stagner, Psychology of Personality (New York: McGraw-Hill Book Company, Inc., 1949), pp. 214-216.

²⁶Shaw and Brown, op. cit., p. 197.

²⁷William D. Winter, "Values and Achievement in a Freshman Psychology Course," Journal of Educational Research, 54:183-186, January, 1961.

right values but not carrying these beliefs into action for one reason or another?" Of the three study groups, the high achievers had made a definite vocational choice. Values which governed choices were opportunity for self-expression, congenial working conditions, and working independently. These people were willing to work hard to accomplish their goals. In conclusion, she said that a given value system was not incidental to achievement.²⁸

Working from the premise that a common value structure existed in cultural patterns and that this structure was related to learning, Lehmann stated:

We adopt those attitudes and values which help us to achieve desired ends and which are normally sanctioned to the community in which we live.²⁹

IV. TEMPERAMENT TRAITS AND ACHIEVEMENT

As yet undefined are the specific factors that influence a student toward underachievement; however, it is apparent that underachievement may be closely related to certain specific personality characteristics. On the part of the bright underachiever certainly there is learning in

²⁸Marilyn Heilfron, "Personal Values and Achievement in College," Personnel and Guidance Journal, 39:138, October, 1960.

²⁹Irvin Jack Lehmann, "Learning Attitudes and Values," Review of Educational Research, 28:468, December, 1958.

progress although that type of achievement is not measured. In an attempt to discover some distinguishing characteristics of high ability students, Shaw and Brown found the "underachievers included in this study were characterized by an attitude of hostility or hypercriticalness with respect to people, which might not necessarily be shown in overt behavior. With regard to the Economic Scale it can be said that there is a tendency among the underachievers to feel that they have not had the material things they would have liked from life when they were living with their parents." In summarizing the meanings of the results, these researchers speculated that underachievement related to the basic personality characteristics of the individual.³⁰ A parallel study later by Shaw with Grubb purposed to relate directly the hostility of able high school students to their lack of academic achievement. In the report the evidence indicated that a difference significant at the one per cent level of confidence existed between female achievers and underachievers, although there was no difference between the males of the two groups. Using the Social Scale of the Bell Preference Inventory and the Hostility Scale of the Guilford-Zimmerman Temperament Survey, the investigators found that hostility appeared to be a more pronounced characteristic of

³⁰ Shaw and Brown, op. cit., p. 199.

male underachievers. This may be observed in the male because of overt behavior; whereas the female may feel the hostility but not express it.³¹

In 1959 Jackson and Getzels reported a study of dissatisfaction with school among adolescents. The variables included individual intelligence tests, achievement tests, personality tests, group Rorschach, teacher ratings, and adjective checklists. Of the two groups--satisfied and dissatisfied--differences were linked with psychological rather than scholastic variables. Dissatisfied boys were rated less desirable and less productive than satisfied boys by their teachers. This was not true of girls.³² Perhaps again, as Shaw and Grubb concluded, boys were more likely to present their feeling negatively than girls.

A continued investigation into the factor analysis and its relationship to academic achievement provided an interesting study by Merrill and Murphy. Significant at the one per cent level the over-achieving group was more dominant and less autonomous, less affirmative and more enduring than

³¹Melville G. Shaw and James Grubb, "Hostility of Able High School Underachievers," Journal of Counseling Psychology, 5:263-266, Winter, 1958.

³²Philip W. Jackson and Jacob W. Getzels, "Psychological Health and Classroom Functioning: A Study of Dissatisfaction with School Among Adolescents," Journal of Educational Psychology, 50:295-300, December, 1959.

the failing group. Variables which did not differentiate were orderliness, heterosexuality, and aggression.³³ Five factors of personality were found the matrix of high-achieving students, and four factors were found the matrix of low-achieving students by Middleton and George Guthrie in their study of personality and academic achievement.³⁴ Burgess worked on the hypothesis that common personality factors differentiated over- and under-achievers in engineering. In small sample groups of twenty each, the over-achievers were more inhibited, more cautious, more intellectually controlled, and had more need for achievement; under-achievers were less intellectually adaptive, tended to over-extend self, were weakly motivated, and tended not to enjoy or see the need of education.³⁵

Factor analyses from 1941 through 1960 have been reported by Gerberich³⁶ with University of Arkansas freshmen,

³³Reed M. Merrill and Daniel T. Murphy, "Personality Factors and Academic Achievement in College," Journal of Counseling Psychology, 6:207, Fall, 1959.

³⁴George Middleton, Jr., and George M. Guthrie, "Personality and Academic Achievement," Journal of Educational Psychology, 50:68-69, April, 1959.

³⁵Elva Burgess, "Personality Factors of Over- and Under-Achievers in Engineering," Journal of Educational Psychology, 47:89-99, February, 1956.

³⁶J. R. Gerberich, "Factors Related to College Achievement of High Aptitude Students Who Fail and Low Aptitude Students Who Exceed Expectations," Journal of Educational Psychology, 32:253-265, April, 1941.

McQuary³⁷ in his non-intellectual characteristics, Bishton³⁸ in his sixteen orthogonal factors of intellectually superior eighth-grade children, and Schutz³⁹ in community characteristics.

V. GOALS AND ACHIEVEMENT

Perhaps it could be appropos to agree with Owens and Johnson who said, "It was possible to isolate certain measurable personality traits peculiar to the underachievers of this study."⁴⁰ That the self-concept and goal aspiration have strongly influenced the level of aspiration and degree of achievement cannot be disregarded. Calia in discussing the motivational factor said that the implication was that so long as a student had a vocational goal and sought help

³⁷John P. McQuary, "Some Relationships Between Non-Intellectual Characteristics and Academic Achievement," Journal of Educational Psychology, 44:215-228, April, 1953.

³⁸Roger Bishton, "A Study of Some Factors Related to Achievement of Intellectually Superior Eighth-Grade Children," Journal of Educational Research, 51:203-207, November, 1957.

³⁹Richard Schutz, "A Factor Analysis of Academic Achievement and Common Characteristics," Educational and Psychological Measurement, 20:513-518, Autumn, 1960.

⁴⁰William A. Owens and W. C. Johnson, "Some Measured Personality Traits of Collegiate Under-achievers," Journal of Educational Psychology, 40:41-46, January, 1949.

from his faculty team, his chances for success were increased.⁴¹ On the other extreme, Schultz and Ricciuti found no consistent differences in various correlations apparent between aspiration instructions which asked for expectations and instructions which asked for goals.⁴² Combs and Snygg felt that goals had important effects on reasoning and learning. They expressed the thought in this way:

There seems almost no limit to the variety in which goals affect behavior. Even the hopes, aspirations, interests, and objectives toward which persons strive will be determined by the goals they have differentiated the perceptual field and the strength of the values which individuals attach to them.⁴³

Different kinds of persons could not be expected to grow and achieve at the same level.

⁴¹Calia, op. cit., p. 190.

⁴²Douglas G. Schultz and Henry N. Ricciuti, "Level of Aspiration Measures and College Achievement," Journal of General Psychology, 51:274, October, 1954.

⁴³Arthur W. Combs and Donald Snygg, Individual Behavior (New York: Harper and Brothers, 1959), p. 102.

CHAPTER III

COMPARATIVE DATA ON THE DIFFERENTIAL APTITUDE TESTS

An aptitude has been defined as a combination of abilities, whether native or acquired, known or believed to be indicative of an individual's capacity to learn in some particular area.¹ An academic aptitude, therefore, has been related to the likelihood of success in mastering academic work. In recent years an aptitude has come to be regarded as a capacity to learn--the result of interaction of heredity and environment. Tests have been devised to measure the level of operation of students. This function has been considered by many educators to be an important aspect of abilities.

In an attempt to identify the abilities of the selected achievers and underachievers of the junior and senior students of Bellaire Senior High School in 1960-1961, the investigator selected the Differential Aptitude Tests. The fact that these tests were developed on scientific, well-standardized procedures to measure the abilities of boys and girls of the secondary level determined the selection of these instruments. When the sample groups had been selected

¹Roger T. Lennon, Test Service Notebook, Number 13 (New York: World Book Company, 1960), p. 1.

and the testing schedule had been provided, the subjects were given the following six tests in the sequence as listed: (1) Verbal Reasoning, (2) Numerical Abilities, (3) Abstract Reasoning, (4) Space Relations, and (5) Mechanical Reasoning.

I. THE DIFFERENTIAL APTITUDE TESTS

Verbal Reasoning. The Verbal Reasoning test was designed to require thinking to produce the right answers. It was a measure of the ability to understand word concepts, to generalize ideas, and to solve simple analogies.

Numerical Abilities. The Numerical Abilities test was devised to demand manipulation of number relationship concepts. The student had to reason and compute arithmetically; he had to deal intelligently with quantitative material.

Abstract Reasoning. The Abstract Reasoning test provided problems for non-verbal measurement. Logic to understand the principles governing the change of figures was required of the students.

Space Relations. The Space Relations test combined the abilities necessary to visualize concrete materials and to imagine how an object would appear if it were rotated in various positions.

Mechanical Reasoning. The Mechanical Reasoning test was an approach to the ease of analyzing in the mechanical field and to the understanding of mechanical and physical principles. Since the items were based on simple, familiar mechanisms of the environment and not the textbook, special knowledge of physics was not necessary.²

II. ANALYSIS OF DIFFERENCES OF RESULTS

Of the one hundred thirty-two achievers who began this testing series, one hundred thirteen completed the entire battery of the Differential Aptitude Tests; of the seventy-six underachievers who began, sixty-one completed all of the tests. When the experimental groups had been tested, the results were recorded in a frequency distribution for each test of the battery. From the tables the means and the standard deviations were computed for both groups. The mean scores presented a differential which indicated a comparative study. The procedure for testing the significance of a difference in the means of samples was the significance ratio, "t." The formula used was presented by E. F. Lindquist in Statistical Analysis in Educational Research.³

²George K. Bennett, Harold G. Seashore, and Alexander G. Wesman, Differential Aptitude Tests, Manual (third edition; New York: The Psychological Corporation, 1959), pp. 5-9.

³E. F. Lindquist, Statistical Analysis in Educational Research (New York: Houghton Mifflin Company, 1940), p. 57.

The results indicated a significant difference in all areas except Abstract Reasoning. The difference in the mean scores of the Verbal Reasoning test was significantly in favor of the achievers at the five per cent level of confidence. Even more significant was the difference in the mean scores on the Numerical Abilities test; this result indicated a difference of "t" ratio at 2.6 (one per cent level of confidence) for the achievers. In Mechanical Reasoning and Space Relations the underachievers produced higher mean scores, each test results showing a difference significant at the one per cent level of confidence. The Abstract Reasoning revealed no difference that could be considered significant. Results of these comparisons are reported in Table III, page 34.

Verbal Reasoning, Numerical Ability, and Abstract Reasoning tests were grouped by the authors to measure functions usually associated with "general intelligence." A comparison of the difference in the mean scores earned by the two experimental groups suggested that the achievers appeared to be superior, since they led in both the verbal and numerical concepts. The underachievers scored equally as well as the achievers in the field of logical reasoning--the abstract. On the basis of this evidence, however, it could not be stated that the achievers possessed a higher degree of "general intelligence" than the underachievers.

TABLE III
MEAN RAW SCORES, STANDARD DEVIATIONS, AND "t" RATIOS
FOR THE DIFFERENTIAL APTITUDE TESTS

Test		Number	Mean	Standard Deviation	"t"
Verbal	A	132	39.2	8.2	2.1*
	U	76	32.7	7.2	
Numerical	A	130	34.7	4.7	2.6**
	U	74	28.1	7.4	
Abstract	A	115	39.7	4.2	NS
	U	69	38.2	5.1	
Space	A	113	62.4	13.1	-2.3*
	U	61	68.8	13.4	
Mechanical	A	122	40.1	10.8	-2.2*
	U	66	45.8	8.7	

A - Achiever

U - Underachiever

* - Significant at the one per cent level of confidence

** - Significant at the five per cent level of confidence

NS - No significance

(See Table IV, page 36.) In the pairing of Space Relations and Mechanical Reasoning, special abilities in dealing with things rather than with people or words were measured. Mean score differences showed that the underachievers were more adept in this skill than the achievers. (See Table V, page 37.)

III. DISTRIBUTION OF PERCENTAGES

On the data analyzed by the Psychological Corporation boys and girls who ranked at or above the sixtieth percentile were considered to be of superior ability.⁴ Since the students in this study were selected, it was expected that a large percentage would score at or above the sixtieth percentile. Of considered value was the knowledge of the percentage of both the achiever and underachiever groups that ranked at or above the sixtieth percentile. In the Verbal and Numerical tests, which have been consistently labeled as predictors of college success, the achievers rated 96.2 per cent on the verbal and 98.4 per cent on the numerical at or above the sixtieth percentile. The under-achievers scored 77.6 per cent on the verbal and 70.8 per cent on the numerical. Percentages on the abstract were

⁴Psychological Corporation, Test Service Bulletin, No. 41, 1951, p. 4.

TABLE IV
DIFFERENCE IN MEAN RAW SCORES
VERBAL REASONING, NUMERICAL ABILITIES,
AND ABSTRACT REASONING TESTS

Test	Mean Scores Achievers	Mean Scores Underachievers	Differences in Mean Scores
Verbal	39.3	32.7	6.6
Numerical	34.7	28.1	6.6
Abstract	39.7	38.2	1.5

TABLE V
DIFFERENCE IN MEAN RAW SCORES
SPACE RELATIONS AND MECHANICAL REASONING TESTS

Test	Mean Scores Achievers	Mean Scores Underachievers	Differences in Mean Scores
Space	62.4	68.8	-6.4
Mechanical	40.1	45.8	-5.7

about equal. The underachievers were somewhat in the lead on Space and Mechanical. This information is given in Table VI, page 39.

Large percentages of both groups scored at or above the fiftieth percentile. High scores were revealed by the achievers with one hundred per cent scoring at or above the fiftieth percentile on the numerical. (See Table VII, page 40.) In all tests for both groups the mean scores were comfortably above the means of the standardizing groups.

The percentages of the achievers at or above the fiftieth and sixtieth percentiles were not significantly higher than those scored by the underachievers; however, in that select bracket--at or above the ninetieth percentile--marked differences were noted in favor of the achievers. (See Table VIII, page 41.)

These findings would tend to indicate that over ninety per cent of the achievers and at least seventy per cent of the underachievers should be provided with the opportunity to go to college.

TABLE VI
PERCENTAGE OF ACHIEVERS AND UNDERACHIEVERS
AT OR ABOVE THE SIXTIETH PERCENTILE
ON THE DIFFERENTIAL APTITUDE TESTS

Test	Achievers	Underachievers	Differences in Percentages
Verbal	96.2	77.6	18.6
Numerical	98.4	70.8	27.6
Abstract	86.1	82.6	3.5
Space	79.3	88.5	- 9.2
Mechanical	42.6	65.4	-22.8

TABLE VII
PERCENTAGE OF ACHIEVERS AND UNDERACHIEVERS
AT OR ABOVE THE FIFTIETH PERCENTILE ON
THE DIFFERENTIAL APTITUDE TESTS

Test	Achievers	Underachievers	Differences in Percentages
Verbal	97.6	80.2	17.4
Numerical	100.8	97.1	3.7
Abstract	94.8	94.1	.7
Space	86.7	90.2	- 3.5
Mechanical	54.1	74.4	-20.3

TABLE VIII
PERCENTAGE OF ACHIEVERS AND UNDERACHIEVERS
AT OR ABOVE THE NINETIETH PERCENTILE
ON THE DIFFERENTIAL APTITUDE TESTS

Test	Achievers	Underachievers	Differences in Percentages
Verbal	75.7	33.3	42.4
Numerical	87.6	44.6	43.0
Abstract	77.3	56.3	21.0
Space	35.4	45.8	-10.4
Mechanical	20.7	29.7	- 9.0

CHAPTER IV

COMPARATIVE STUDY ON THE KUDER PREFERENCE RECORD--VOCATIONAL

Vocational interest, as measured by responses to choices of items, has been identified with a student's preference in broad occupational areas. The expression of pleasure in group activities, desire to explore new situations, need to be self-assertive, or satisfaction in working with ideas have indicated his work preference. In the study of achievers and underachievers as to vocational interest the Kuder Preference Record--Vocational was the instrument used.

The first standardized Kuder Preference Record--Vocational, published in 1939, included seven interest areas. The 1942 edition included nine interest areas. Form C, 1948, which presented the ten areas presently used, provided new boy/girl norms and new boy/girl profiles. The main purpose of the Record was to assist individuals in narrowing the field of occupational choice so that investigation of interests would be feasible. A preference or preferences could be identified from ten broad areas which were briefly described and suggested several related occupations.¹

¹Kuder Preference Record, Vocational Form-C, Examiner Manual (Chicago: Science Research Associates, 1956), pp. 5-13.

I. INTEREST AREAS OF THE KUDER PREFERENCE RECORD

The following statements describe the interest areas of the Kuder Preference Record:

Outdoor: Interest in animals and growing things; occupations of forest rangers, naturalists, and farmers;

Mechanical: Preference for work with machines and tools; jobs as automobile repairmen, watchmakers, drill press operators, and engineers;

Computational: Interest in work with numbers; jobs as bookkeeper, accountant, or bank teller;

Scientific: Desire for new facts and problem solutions; professions and occupations of doctor, chemist, nurse, engineer, radio repairman, aviator, and dietician;

Persuasive: Interest in meeting and dealing with people and promoting projects or things to sell; occupations as actors, politicians, radio announcers, authors, salesmen, and store clerks;

Artistic: Preference for creative work with the hands; artistic work as painter, sculptor, architect, dress designer, hair dresser, and interior decorator;

Literary: Desire to read and to write; vocations as novelist, historian, teacher, actor, news reporter, editor, drama critic, librarian and book reviewer;

Musical: Interest in hearing, playing, or reading in the area of music; professions in singing or playing musical instruments;

Social Service: A desire to help people; occupations as nurse, Boy or Girl Scout leader, counselor, tutor, minister, personnel worker, social worker, and hospital attendant;

Clerical: Preference for office work of precision and accuracy; jobs as bookkeeper, accountant, file clerk, sales clerk, secretary, statistician, and traffic manager.

II. RANGE OF DISTRIBUTION OF SCORES

The Kuder Vocational Preference Record was selected to discover the range and distribution of vocational interests of the achievers and underachievers of this study. A first investigation of the boy achievers and underachievers and the girl achievers and underachievers did not reveal many areas of widest range. There appeared to be some extremes for both groups. These results were summarized in Table IX, page 45. For the boys the widest range was in the area of social service; the achiever boys did not score above the thirty-fifth percentile, indicating a low preference for this field. In the mechanical interest, boy achievers did not score above the eighty-third percentile, and in the clerical preference, boy underachievers did not score above

TABLE IX
RANGE OF DISTRIBUTION OF SCORES ON THE KUDER
VOCATIONAL PREFERENCE RECORD--BOYS

Interest		Range of Scores	Range of Percentiles
Outdoor	A	13-70	01-96
	U	15-71	01-96
Mechanical	A	12-56	01-83
	U	22-62	07-95*
Computational	A	12-46	02-96
	U	22-56	25-99*
Scientific	A	22-64	04-99
	U	29-65	15-99
Persuasive	A	20-64	06-92
	U	29-74	03-97
Artistic	A	8-43	02-96
	U	9-44	03-97
Literary	A	8-36	04-97
	U	7-34	04-94
Musical	A	3-30	05-99
	U	1-27	01-97
Social Service	A	7-36	01-35
	U	22-70	06-97*
Clerical	A	18-66	01-93
	U	23-60	03-85*

A - Achiever
U - Underachiever
* - Widest range

the eighty-fifth percentile. In all other areas both groups of boys scored above the ninetieth percentile. With the exception of two areas, both the achievers and underachievers scored below the tenth percentile. Boy underachievers did not score below the twenty-fifth percentile in computational, or below the fifteenth percentile in the scientific.

The girls tended to differ in a few more areas than the boys. In the outdoor, scientific, persuasive, and artistic, girl underachievers did not score below the tenth percentile; girl achievers scored below the tenth percentile; in every area except the outdoor. In the persuasive, musical, and social service, no girl underachiever scored above the eighty-eighth percentile; girl achievers scored above the ninetieth percentile in every area. See Table X, page 47.

III. EXTREME SCORES

Interest patterns at the ninetieth percentile were computed for the achievers and underachievers who scored at or above the ninetieth percentile and at or below the tenth percentile. Differences were found particularly in the computational and persuasive, with larger numbers of achievers scoring at both extremes. Other differences for extreme scores were registered by the achievers in the mechanical and by the underachievers in the literary.

TABLE X
RANGE OF DISTRIBUTION OF SCORES ON THE KUDER
VOCATIONAL PREFERENCE RECORD--GIRLS

Interest		Range of Scores	Range of Percentiles
Outdoor	A	26-69	30-99
	U	20-60	15-98
Mechanical	A	7-50	07-99
	U	10-43	06-91
Computational	A	5-48	01-99
	U	8-38	03-93
Scientific	A	17-61	05-99
	U	24-50	18-92
Persuasive	A	9-60	01-96
	U	24-50	16-75*
Artistic	A	4-50	01-97
	U	19-45	25-94*
Literary	A	3-33	01-90
	U	3-35	01-92
Musical	A	3-28	02-98
	U	5-23	06-87*
Social Service	A	20-78	02-99
	U	31-64	09-88*
Clerical	A	23-84	01-99
	U	18-80	01-94

A - Achiever
U - Underachiever
* - Widest range

Students at or above the fiftieth percentile did not present any wide differences except in social service; over twenty-four per cent more achievers than underachievers scored at or above the median percentile. The achievers led in scientific; whereas the underachievers were ahead in mechanical and persuasive. Distributions of percentages at the three levels were reported in Table XI, page 49.

IV. FIRST PREFERENCES

The first preferences as selected by the two groups were listed in Table XII, page 50. Differences were discovered in the rank order of all interests except clerical and mechanical, which were the last two for each group. The achievers placed mechanical last; the underachievers placed clerical last. In the first four choices only computational was rated high on both lists.

V. INSIGNIFICANT DIFFERENCES

The only interest of any significance was established by the achievers in the computational. Here the greatest number for any interest scored at or above the ninetieth percentile. Computational was the first interest preference of twenty-five achievers. Other choices of the students were scattered to the extent that no significant differences were indicated. This may in part be the result of some

TABLE XI

PERCENTAGES AT OR ABOVE THE NINETIETH AND THE FIFTIETH
PERCENTILES AND AT OR BELOW THE TENTH PERCENTILE
ON THE KUDER VOCATIONAL PREFERENCE RECORD

Interest		Percentages At or Above the Ninetieth Percentile	Percentages At or Above the Fiftieth Percentile	Percentages At or Below the Tenth Percentile
Outdoor	A	11.8	52.8	15.3
	U	14.2	51.9	9.4
Mechanical	A	7.1	31.9	27.6
	U	5.1	40.5*	17.5*
Computational	A	25.5	59.5	15.8
	U	7.2*	57.5	8.5*
Scientific	A	20.2	64.8	5.4
	U	14.2	51.2*	2.5
Persuasive	A	12.3	22.3	40.4
	U	4.8*	43.9*	14.2*
Artistic	A	5.8	56.8	13.9
	U	4.1	48.3	12.2
Literary	A	16.7	61.7	6.7
	U	16.5	53.2	19.4*
Musical	A	6.7	41.5	22.4
	U	4.1	42.6	24.4
Social Service	A	9.4	70.3	14.2
	U	9.5	55.7*	15.6
Clerical	A	5.4	36.2	19.7
	U	4.1	34.1	19.4

A - Achievers
U - Underachievers
* - Widest range

TABLE XII
RANK ORDER OF FIRST PREFERENCE OF INTEREST AS
EXPRESSED BY ACHIEVERS AND UNDERACHIEVERS ON
THE KUDER VOCATIONAL PREFERENCE RECORD

Achievers		Underachievers	
Interest	Number	Interest	Number
Computational	25	Outdoor	14
Scientific	21	Literary	11
Persuasive	18	Computational	10
Literary	16	Social Service	8
Artistic	15	Scientific	7
Social Service	12	Musical	7
Outdoor	10	Artistic	6
Musical	9	Persuasive	5
Clerical	7	Mechanical	4
Mechanical	4	Clerical	2
Total	127		74

difficulties encountered in the actual marking of the inventory by the subjects. The problem of choosing from a list of items which did not offer any definite "like" or "dislike," or of items about which there was no knowledge, forced some individuals to make incorrect responses. Students may have had enough knowledge to produce a high or low score, but not enough to produce a meaningful one.²

²John W. M. Rothney and Louis G. Schmidt, "Some Limitations of Interest Inventories," Personnel and Guidance Journal, 33:201, April, 1936.

CHAPTER V

COMPARATIVE FINDINGS ON THE ALLPORT-VERNON STUDY OF VALUES

A principle or quality regarded as intrinsically desirable has been classed as a value. When value has been placed on something, an effective regard has been shown toward a property of that which has been esteemed. Combs and Snygg have said that values have resulted from differentiations that people have made to meet need satisfaction.¹

Although values as such have posed a problem of measurement, opinion scales have been constructed by collecting data about a certain psychological object. Because the opinion inventories usually by necessity named the stereotype, they were similar to the adjective analysis of stereotype. Hence, Allport and Vernon in their development of the Study of Values began with a theoretical discussion of Spranger in which six basic value types were proposed: the theoretical, the economic, the aesthetic, the social, the political, and the religious types. Each was then considered as a hypothetical extreme which various people approached by degrees.²

¹Arthur W. Combs and Donald Snygg, Individual Behavior (New York: Harper and Brothers, 1959), p. 102.

²Ross Stagner, Psychology of Personality (New York: McGraw-Hill Book Company, Inc., 1949), p. 215.

From the original Study of Values published in 1931 the developers of this scale presented a revised form in 1951. Improvement was made in redefinition of the social value. The new edition limited the item to measure altruistic love or philanthropy rather than the original social value which stood for love in any form. The third edition (1960) made no changes in the items, but changed the score sheet and enlarged and improved the norms. The Study of Values was devised to measure the dominant interests in personality by six basic interests or motives.³

I. THE SIX VALUES OF THE SCALE

There were six values of the scale.

The Theoretical. Dominant interest was truth discovered through observation and reason.

The Economic. Characteristic interest was in the useful based on bodily needs and the practical affairs of business.

The Aesthetic. Highest value was in form and harmony of experiences in life.

The Social. Highest regard was for love as the only suitable form of human relationship.

³Gordon W. Allport, Philip E. Vernon, and Gardner Lindzey, Study of Values (third edition; Boston: Houghton Mifflin Company, 1960), p. 9.

The Political. Primary interest was in power as necessary for competition, leadership, and struggle in life.

The Religious. Satisfying experience was unity directed to relation of the individual to the cosmos as a whole.

II. METHOD OF STUDY

The achievers and underachievers of this study were permitted to take and to score the tests at home. As suggested by the authors of the scale, the subjects could follow this procedure, but the examiner was obliged to check the transcribing and computation of scores. Hence, a careful verification of computation was made. The study was first directed to boys and girls separately. From frequency distributions mean scores were computed for boys and girls of both groupings.

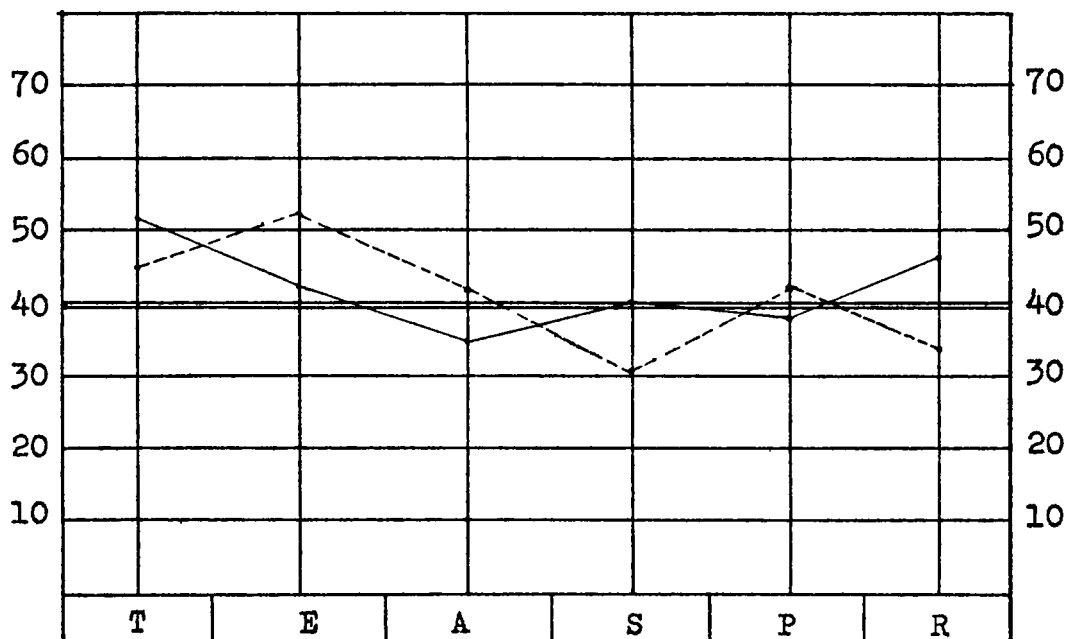
III. VALUES OF BOYS AND GIRLS

Boy underachievers revealed a "mixture" of types by scoring highest in the Economic and second in the Aesthetic, thus indicating that they would not belong exclusively to one type. Boy achievers led in the Reflective and the Social, but they placed the greatest value on the Theoretical and Political as scored by the two groups. (See Table XIII, page 55, and Figure 1, page 56.) Girls showed very little

TABLE XIII
MEAN RAW SCORES FOR BOYS
ALLPORT-VERNON STUDY OF VALUES

Value	Achievers	Underachievers	Difference M
Theoretical	50.6	46.3	4.3
Economic	42.2	52.6	-10.4
Aesthetic	35.5	43.5	- 8.0
Social	39.9	30.1	9.8
Political	39.2	42.3	- 3.1
Religious	46.7	36.4	10.3

FIGURE 1
 MEAN RAW SCORES FOR BOYS
 ALLPORT-VERNON STUDY OF VALUES



T - Theoretical
 E - Economic
 A - Aesthetic
 S - Social
 P - Political
 R - Religious

Achievers —————
 Underachievers - - - - -

difference in any areas. The highest values for achiever girls were placed on the Reflective, the Theoretical, and the Social. Underachiever girls rated the Reflective first and the Aesthetic second. Both groups placed emphasis on the Reflective value. Girl achievers' mean score on the Theoretical was the lowest of any score for boys or girls of either sample. (See Table XIV, page 58, and Figure 2, page 59.)

IV. VALUES OF ACHIEVERS AND UNDERACHIEVERS

Average mean scores for boys and girls combined indicated that achievers placed higher value on the Reflective, the Theoretical, and the Social; the under-achievers registered preference for the Political, the Economic, and the Aesthetic. (See Table XV, page 60, and Figure 3, page 61.)

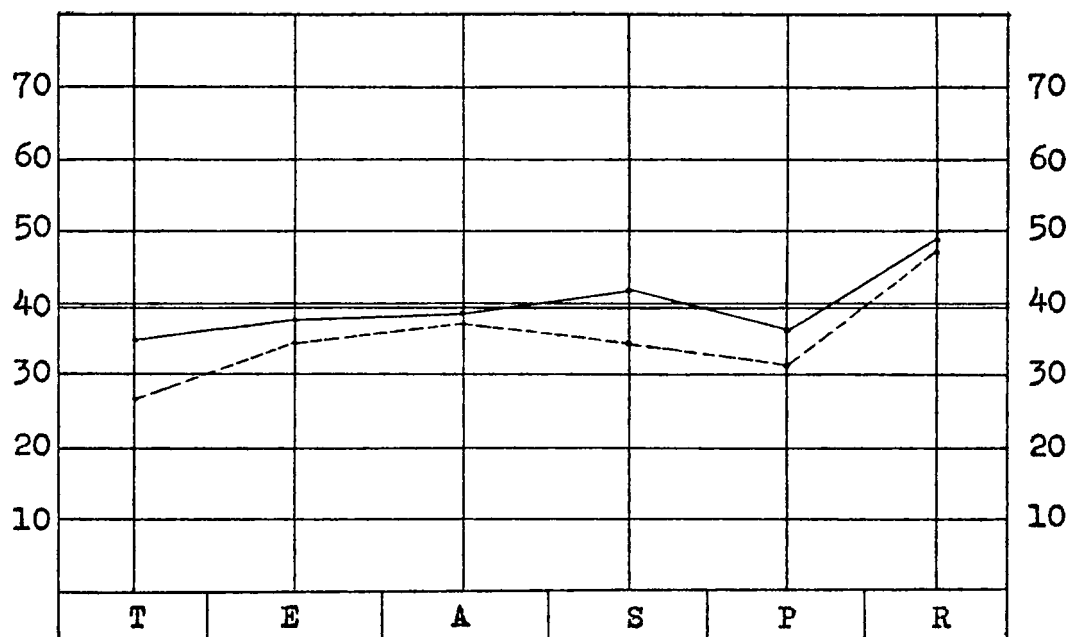
V. EXTREME AND AVERAGE SCORES

A further study of the performance of the achievers and underachievers on the Values Scale was an examination of extreme and average scores. The score sheet presented a range of high and low scores of two divisions; one, scores outside the range of eighty-two per cent of all scores, and two, scores outside the range of fifty per cent of all scores. Underachievers tended to extreme scores to a greater extent

TABLE XIV
MEAN RAW SCORES FOR GIRLS
ALLPORT-VERNON STUDY OF VALUES

Value	Achievers	Underachievers	Difference M
Theoretical	34.6	26.1	8.5
Economic	36.3	33.9	2.4
Aesthetic	39.4	38.7	.7
Social	40.5	35.4	5.1
Political	36.4	32.8	3.6
Religious	48.3	48.1	.2

FIGURE 2
 MEAN RAW SCORES FOR GIRLS
 ALLPORT-VERNON STUDY OF VALUES



T - Theoretical
 E - Economic
 A - Aesthetic
 S - Social
 P - Political
 R - Religious

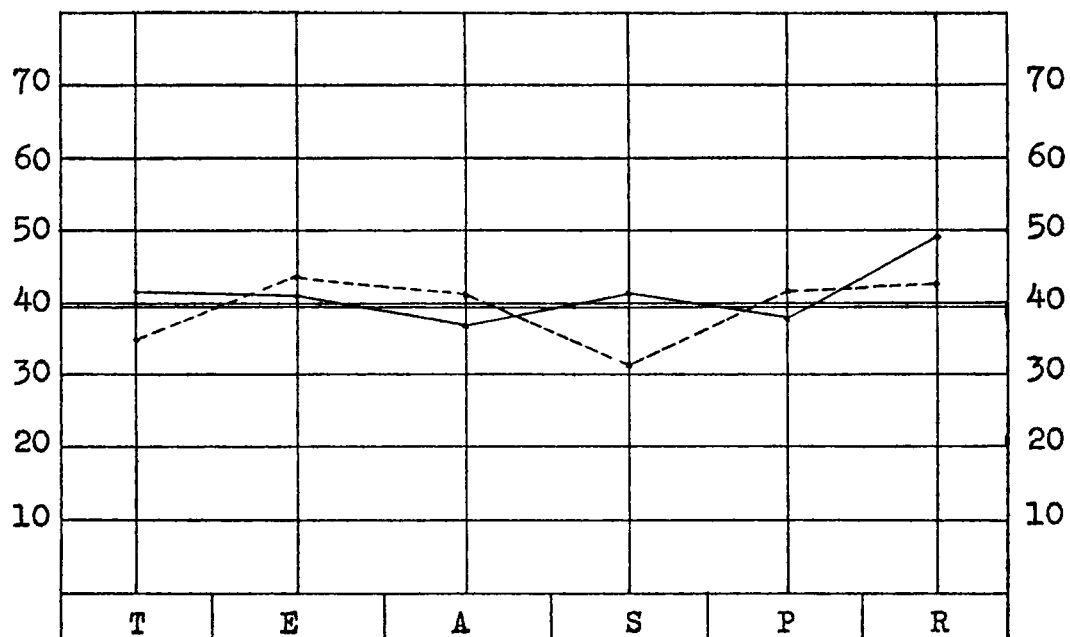
Achievers —————
 Underachievers - - - - -

TABLE XV
AVERAGE MEAN SCORES FOR BOYS AND GIRLS COMBINED
ALLPORT-VERNON STUDY OF VALUES

Value	Achievers	Underachievers	Difference M
Theoretical	42.6	36.2	6.4
Economic	40.7	43.3	-2.6
Aesthetic	37.4	40.6	-3.2
Social	39.2	32.7	6.5
Political	37.8	37.4	.4
Religious	47.5	42.2	5.3

FIGURE 3

AVERAGE MEAN SCORES FOR BOYS AND GIRLS COMBINED
ALLPORT-VERNON STUDY OF VALUES



T - Theoretical
E - Economic
A - Aesthetic
S - Social
P - Political
R - Religious

Achievers —————
Underachievers - - - - -

than did the achievers. High percentages were noted for above range scores for underachievers in the Aesthetic, the Theoretical, the Economic, and the Religious; for below range scores, their percentages were found to be high in the Theoretical, the Economic, and the Religious. Percentages of subjects who scored at the average score were found to be low. Underachievers scored lower percentages in every value than did the achievers. In the Economic no underachiever scored an average score. These findings were reported in Table XVI, page 63.

The Study of Values was so constructed that it measured more than one single variable; however, it measured only their relative strength. In general when a person scored high in one value, he scored lower in another. Few people obtained average scores for more than one or two values. The extremes were scores of significance for the individual's profile.

TABLE XVI
DISTRIBUTION OF PERCENTAGES OF SCORES
ON THE ALLPORT-VERNON STUDY OF VALUES
FOR ACHIEVERS AND UNDERACHIEVERS

Value		Percentage of Scores Above or Below 82% of All Scores		Percentage of Scores Above or Below 50% of All Scores		Percentage of Scores at the Average Score
		Above	Below	Above	Below	
Theoretical	A	10.9	13.4	13.6	8.2	4.5
	U	11.1	21.1	34.4*	11.2	3.2
Economic	A	10.0	3.6	9.1	10.9	9.1
	U	14.5	11.2	25.8*	27.4*	0.0
Aesthetic	A	7.2	5.4	12.6	11.7	15.3
	U	29.1*	2.4	33.8*	12.9	9.6
Social	A	14.4	13.3	27.1	13.5	26.2*
	U	0.0	22.5*	8.1	43.5*	12.8
Political	A	5.4	18.1	12.6	26.1	18.3
	U	9.5	17.7	18.3	25.6	19.5
Religious	A	20.8*	4.5	52.2*	9.3	5.5
	U	9.8	17.5	24.2*	24.2*	4.5

A - Achiever

U - Underachiever

* - High percentages of extremes

CHAPTER VI

COMPARATIVE DISTRIBUTIONS OF TEMPERAMENT TRAITS ON THE THURSTONE TEMPERAMENT SCHEDULE

The behavior of a person has developed from his manner of thinking, feeling, and acting. The distinguishing characteristics of his personality have been called his temperament traits.¹ The importance of these traits has been emphasized by psychologists, clinicians, educators, and test constructors. The result has been that many tests and scales have been devised to analyze a person in terms of psychotic and neurotic tendencies. A test to measure such tendencies was not selected for this investigation because the purpose was limited to the description of two groups of students as to certain aspects of temperament. No attempt was made to discover or appraise any maladjustment.

The Thurstone Temperament Schedule was designed to assess those traits which seemed to be relatively permanent for each person. Excluded in this scale were traits which reflected recent social experience, social identifications, disturbing experiences, or exposure to propaganda.²

¹Ross Stagner, Psychology of Personality (New York: McGraw-Hill Book Company, Inc., 1949), p. 140.

²L. L. Thurstone, Thurstone Temperament Schedule, Examiner Manual (second edition; Chicago: Science Research Associates, Inc., 1953), p. 3.

I. TRAITS OF THE SCALE

On a relatively short questionnaire, seven areas of temperament were appraised. Description of each area has been based on the meaning of a high score in that trait:

Active: Rapid movement and work; restlessness; tendency to hurry;

Vigorous: Participation in physical sports; work with use of hands and tools; outdoor occupations;

Impulsive: Happy-go-lucky, carefree, daredevil disposition; quick decisions; frequent change from one task to another;

Dominant: Capable of taking leadership and responsibility; not domineering but able to take charge; speakers, organizers, promoters, and persuaders;

Stable: Cheerful, even disposition; disregard of noise and other distractions; not easily annoyed or irritated;

Social: Enjoyment of company of others; friendly, sympathetic, cooperative, agreeable;

Reflective: Preference for meditative and reflective thinking; theoretical rather than practical approach to problems; quiet, accurate.

II. METHOD OF STUDY

This self-administering scale was presented to the achievers and the underachievers of the study sample. When

the tests had been completed and scored, a profile was provided for each student. The frequency distributions of the scores were recorded by percentile bands of divisions suggested by the profile chart. These divisions were very high, 90-100; high, 80-89; high average, 60-79; average, 40-59; low average 20-39; low, 10-19; and very low, 0-9. The percentages of scores registered in each percentile band were computed for the achievers and the underachievers. This procedure was followed for each trait of the scale. The results of the traits were studied.

III. DISTRIBUTION OF PERCENTAGES

In the active area the underachievers were found to have scored percentages considerably larger than the achievers in the very high and the high divisions. It was noted that more achievers than underachievers were in the average, low average, and low sections. High average and very low scores were similar. Refer to Table XVII, page 67, and Figures 4 and 5, pages 68 and 69.

The underachievers showed larger percentages than the achievers in the very high, high, and high average levels of the vigorous trait. In the average, low average, low, and very low the achievers were favored. The greatest difference in numbers was in low average. Here, the achievers registered

TABLE XVII
DISTRIBUTION OF PERCENTAGES
ACTIVE TRAIT

	Achievers	Underachievers
Very High 90-100	9.9	20.6
High 80-89	10.7	28.5
High Average 60-79	13.4	14.2
Average 40-59	21.4	12.3
Low Average 20-39	26.7	11.1
Low 10-19	10.7	4.7
Very Low 0-9	7.1	7.9

FIGURE 4
DISTRIBUTION OF PERCENTAGES
ACTIVE TRAIT--
ACHIEVERS

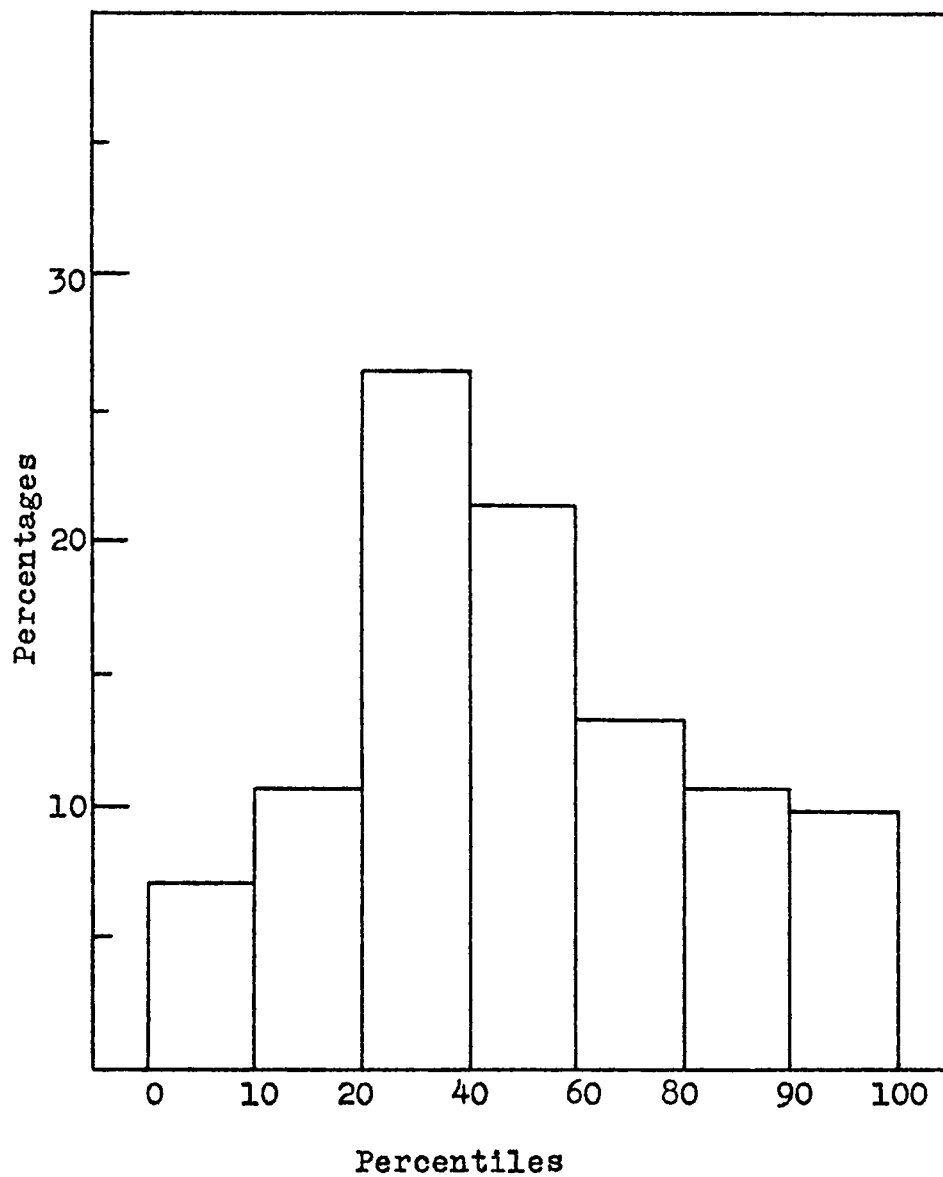
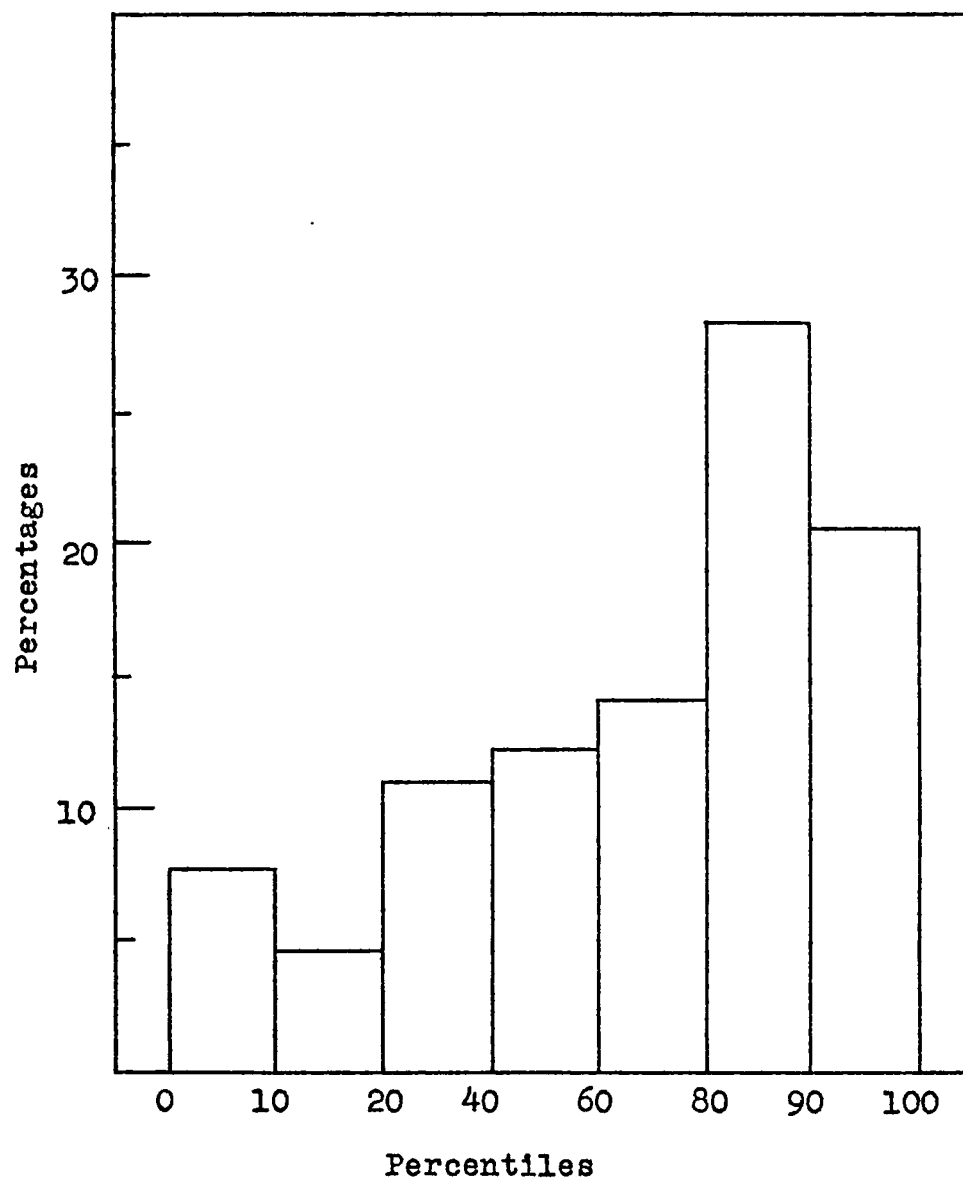


FIGURE 5
DISTRIBUTION OF PERCENTAGES
ACTIVE TRAIT--
UNDERACHIEVERS



twelve per cent more than the underachievers. Refer to Table XVIII, page 71, and Figures 6 and 7, pages 72 and 73.

When the impulsive scale was checked, it was found that the achievers were leading in very high, high, and average by very small percentages. The achievers were considerably ahead in the very low bracket. The underachievers did not record a number in the very high divisions. They led, however, in the high average. Differences of 5.4 per cent and 8.7 per cent for low average and low revealed that the underachievers scored greater numbers than the achievers. See Table XIX, page 74, and Figures 8 and 9, pages 75 and 76.

In the dominant area the achievers were slightly above in very high, high, low average, and average. The underachievers scored somewhat above the achievers in high average and low average. The underachievers led by almost ten per cent in the average. Refer to Table XX, page 77, and Figures 10 and 11, pages 78 and 79.

The highest percentage in the stable trait was recorded for the underachievers in the low average column. The underachievers recorded 11.7 per cent more than the achievers in average and 3.3 per cent more in low. More achievers than underachievers ranked in very high, high, high average, and very low. A larger number of achievers

TABLE XVIII
DISTRIBUTION OF PERCENTAGES
VIGOROUS TRAIT

	Achievers	Underachievers
Very High 90-100	5.3	17.4
High 80-89	7.1	15.8
High Average 60-79	17.8	22.2
Average 40-59	17.8	12.3
Low Average 20-39	23.2	11.1
Low 10-19	13.4	9.5
Very Low 0-9	15.1	11.1

FIGURE 6
DISTRIBUTION OF PERCENTAGES
VIGOROUS TRAIT--
ACHIEVERS

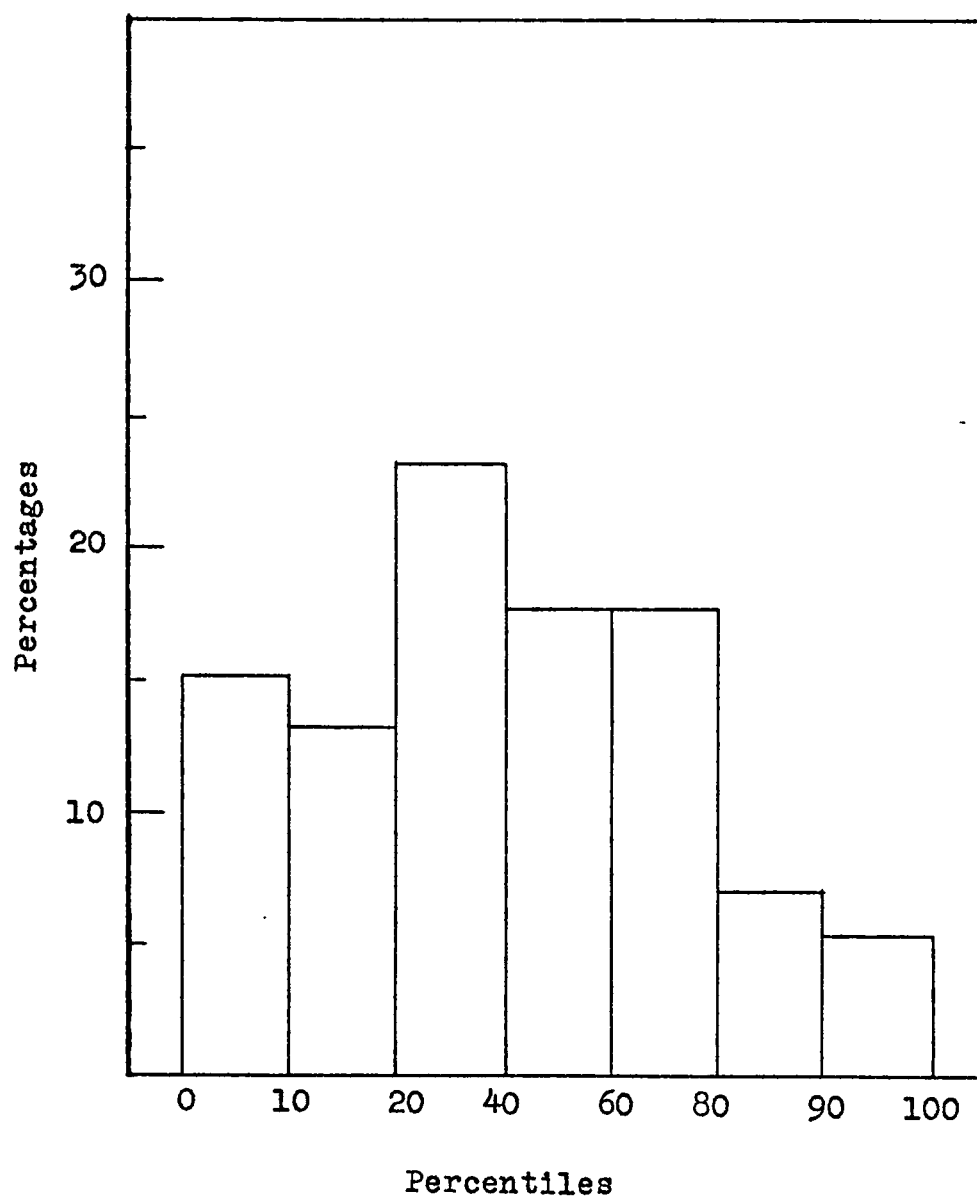


FIGURE 7
DISTRIBUTION OF PERCENTAGES
VIGOROUS TRAIT--
UNDERACHIEVERS

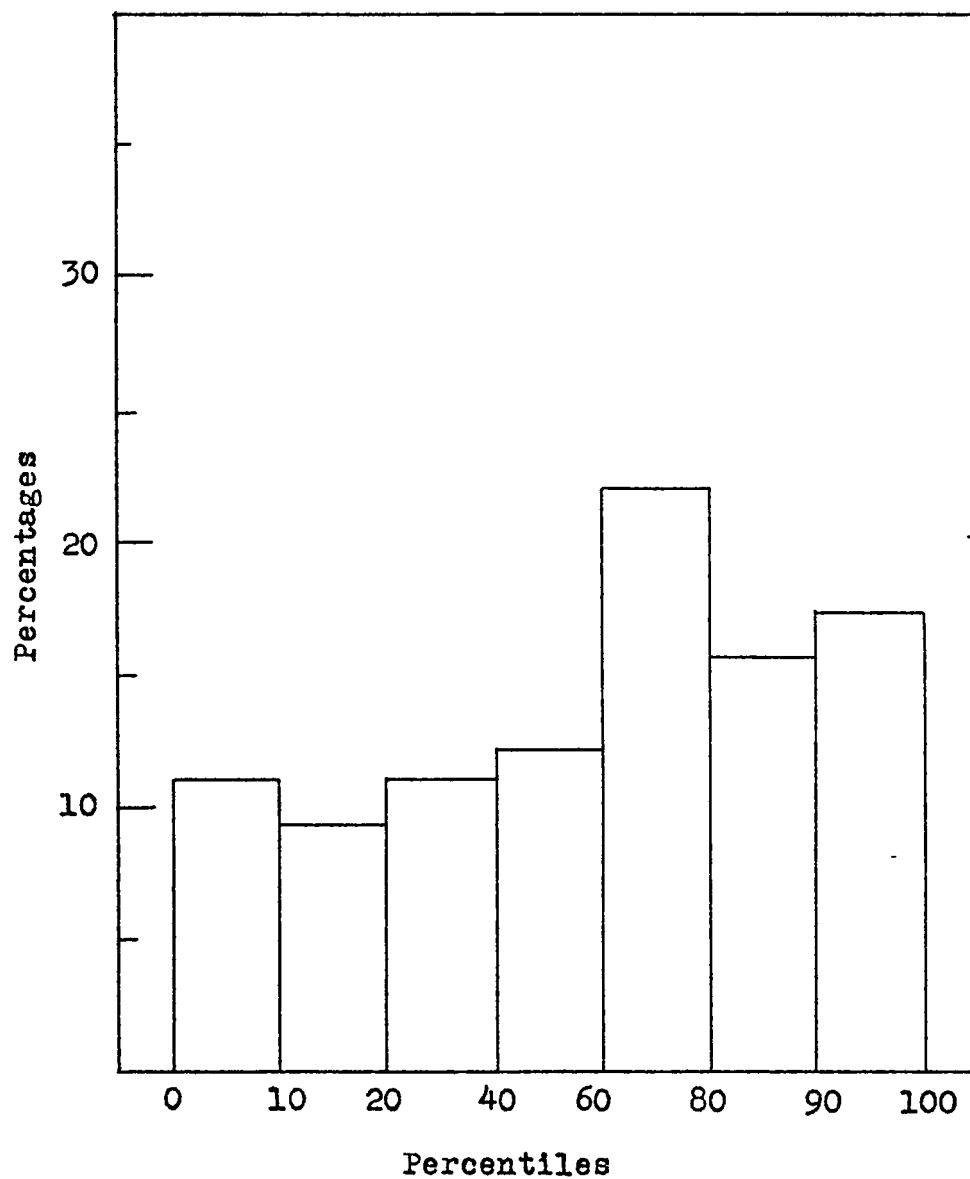


TABLE XIX
DISTRIBUTION OF PERCENTAGES
IMPULSIVE TRAIT

	Achievers	Underachievers
Very High 90-100	3.6	0.0
High 80-89	7.1	7.9
High Average 60-79	10.7	17.4
Average 40-59	16.8	15.8
Low Average 20-39	16.8	22.2
Low 10-19	15.1	23.8
Very Low 0-9	29.1	12.3

FIGURE 8
DISTRIBUTION OF PERCENTAGES
IMPULSIVE TRAIT--
ACHIEVERS

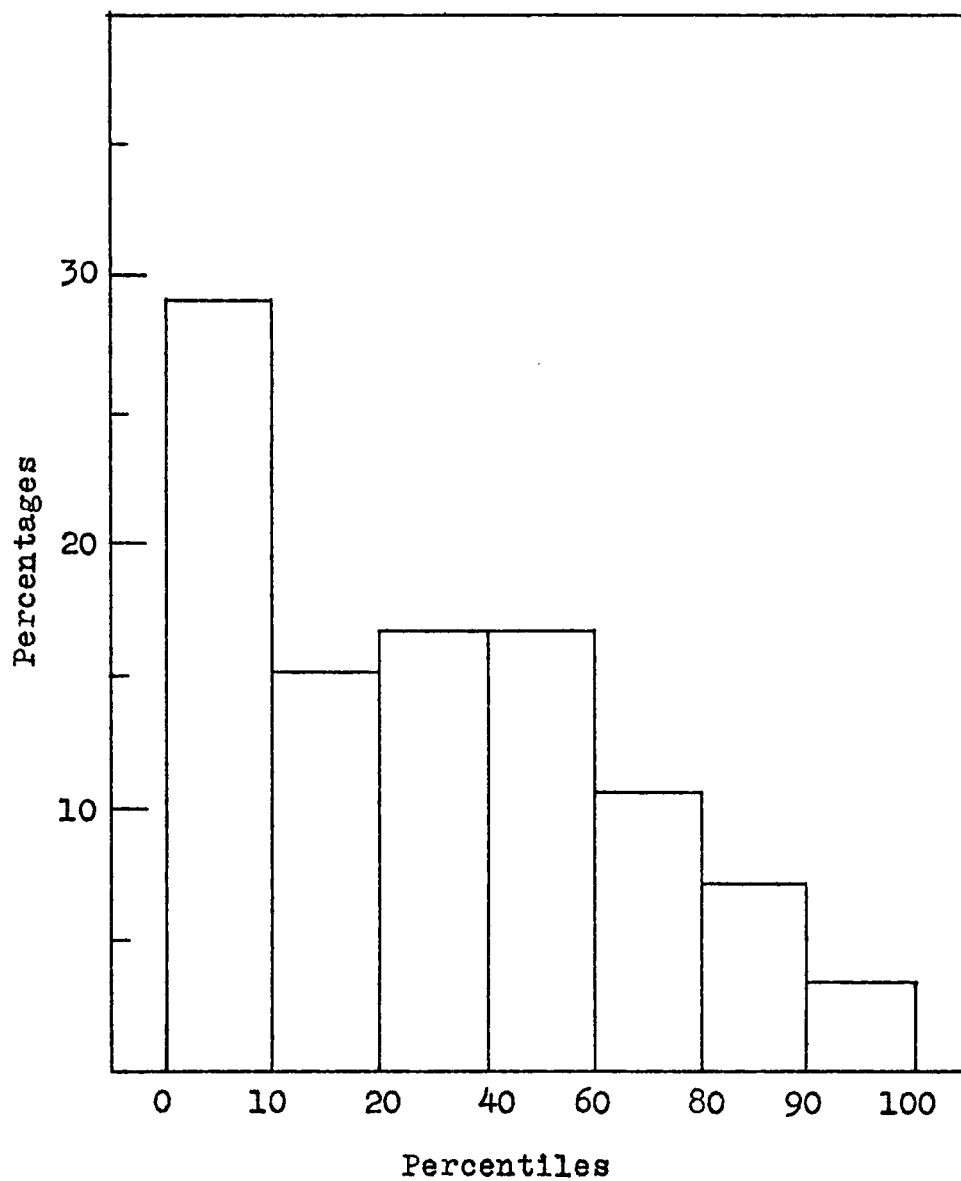


FIGURE 9
DISTRIBUTION OF PERCENTAGES
IMPULSIVE TRAIT--
UNDERACHIEVERS

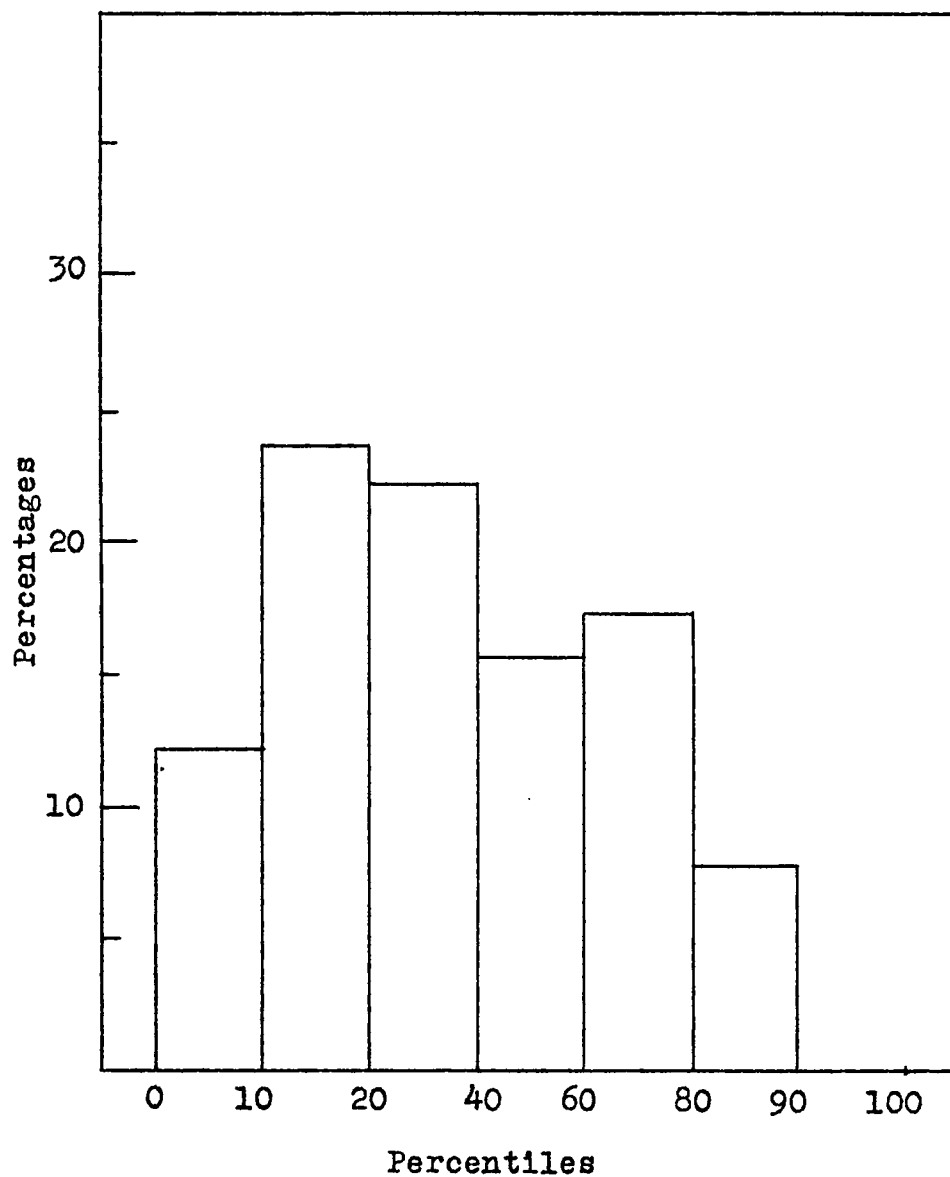


TABLE XX
DISTRIBUTION OF PERCENTAGES
DOMINANT TRAIT

	Achievers	Underachievers
Very High 90-100	13.4	7.9
High 80-89	12.3	9.5
High Average 60-79	21.4	23.8
Average 50-59	18.7	28.5
Low Average 20-39	11.6	15.8
Low 10-19	10.7	4.7
Very Low 0-9	11.6	9.5

FIGURE 10
DISTRIBUTION OF PERCENTAGES
DOMINANT TRAIT--
ACHIEVERS

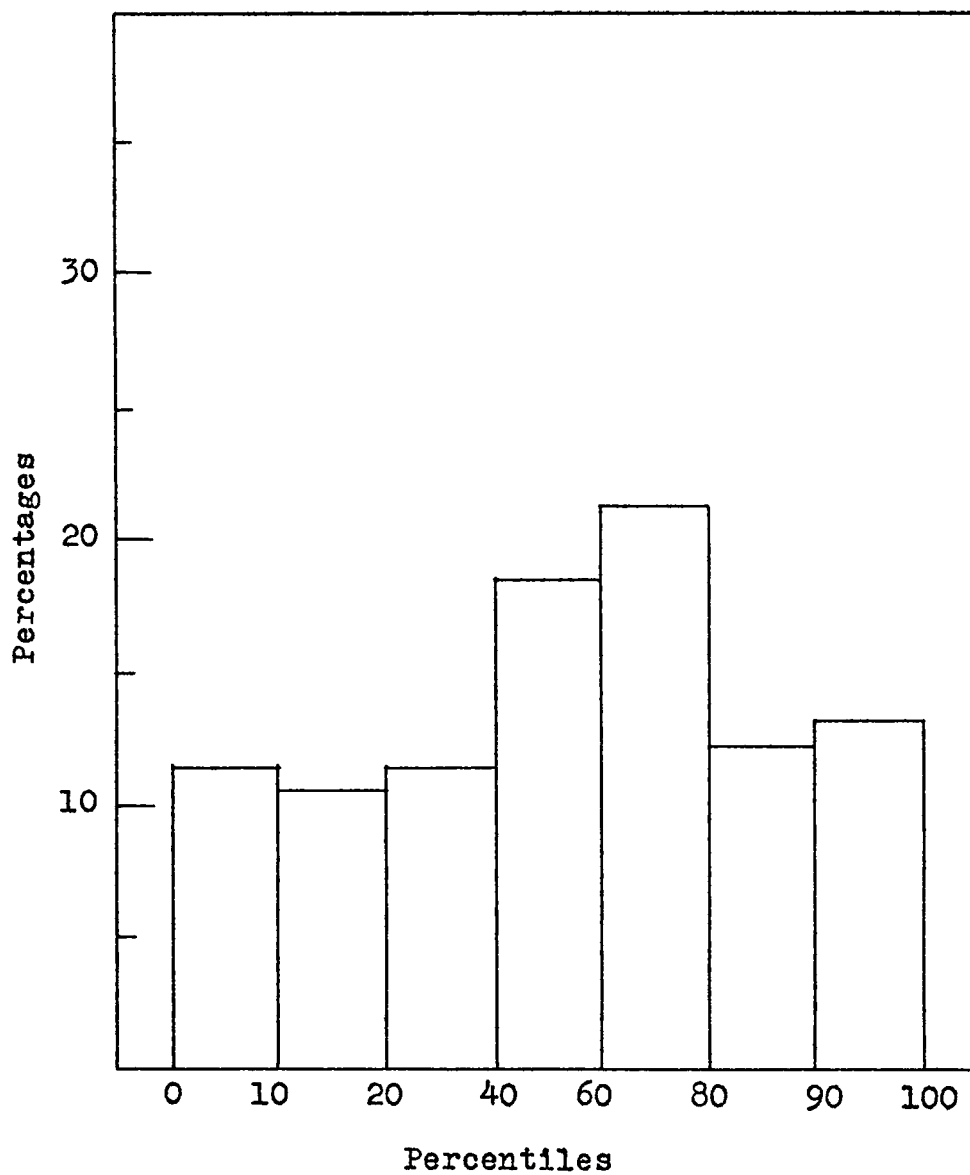
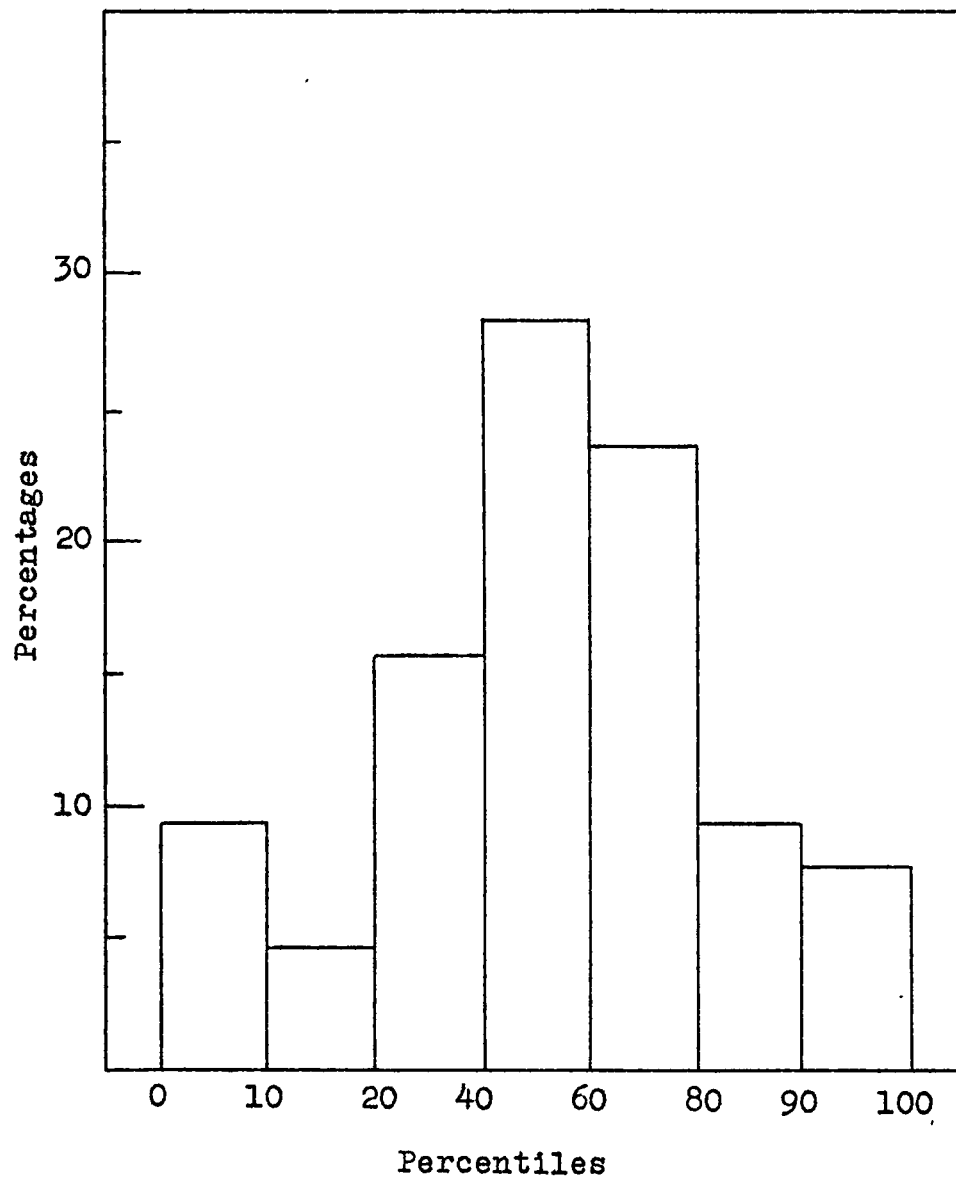


FIGURE 11
DISTRIBUTION OF PERCENTAGES
DOMINANT TRAIT--
UNDERACHIEVERS



than underachievers scored as high average in stability. (See Table XXI, page 81, and Figures 12 and 13, pages 82 and 83.)

Scores for the two groups appeared to be more similar in the social area than in any of the other traits on the scale. In the achiever column percentages were greater than in the underachiever column in high, average, low, and very low. The underachievers led in very high, high, high average, and low average. The largest differences in the percentages were in high average and very low. The achievers registered 13.3 per cent more than the underachievers in very low. Refer to Table XXII, page 84, and Figures 14 and 15, pages 85 and 86.

For the achievers 27.5 and for the underachievers 26.3, which represented highest percentages by both groups, were recorded in the very high band of the reflective characteristic. Differences fluctuated on this scale in the other levels of measurement. The achievers had more in very high and very low than did the underachievers. The underachievers had larger percentages than the achievers in all other areas. See Table XXIII, page 87, and Figures 16 and 17, pages 88 and 89.

TABLE XXI
DISTRIBUTION OF PERCENTAGES
STABLE TRAIT

	Achievers	Underachievers
Very High 90-100	10.7	7.9
High 80-89	10.7	6.3
High Average 60-79	27.6	15.8
Average 40-59	14.1	23.8
Low Average 20-39	16.8	28.5
Low 10-19	6.2	9.5
Very Low 0-9	13.4	7.9

FIGURE 12
DISTRIBUTION OF PERCENTAGES
STABLE TRAIT--
ACHIEVERS

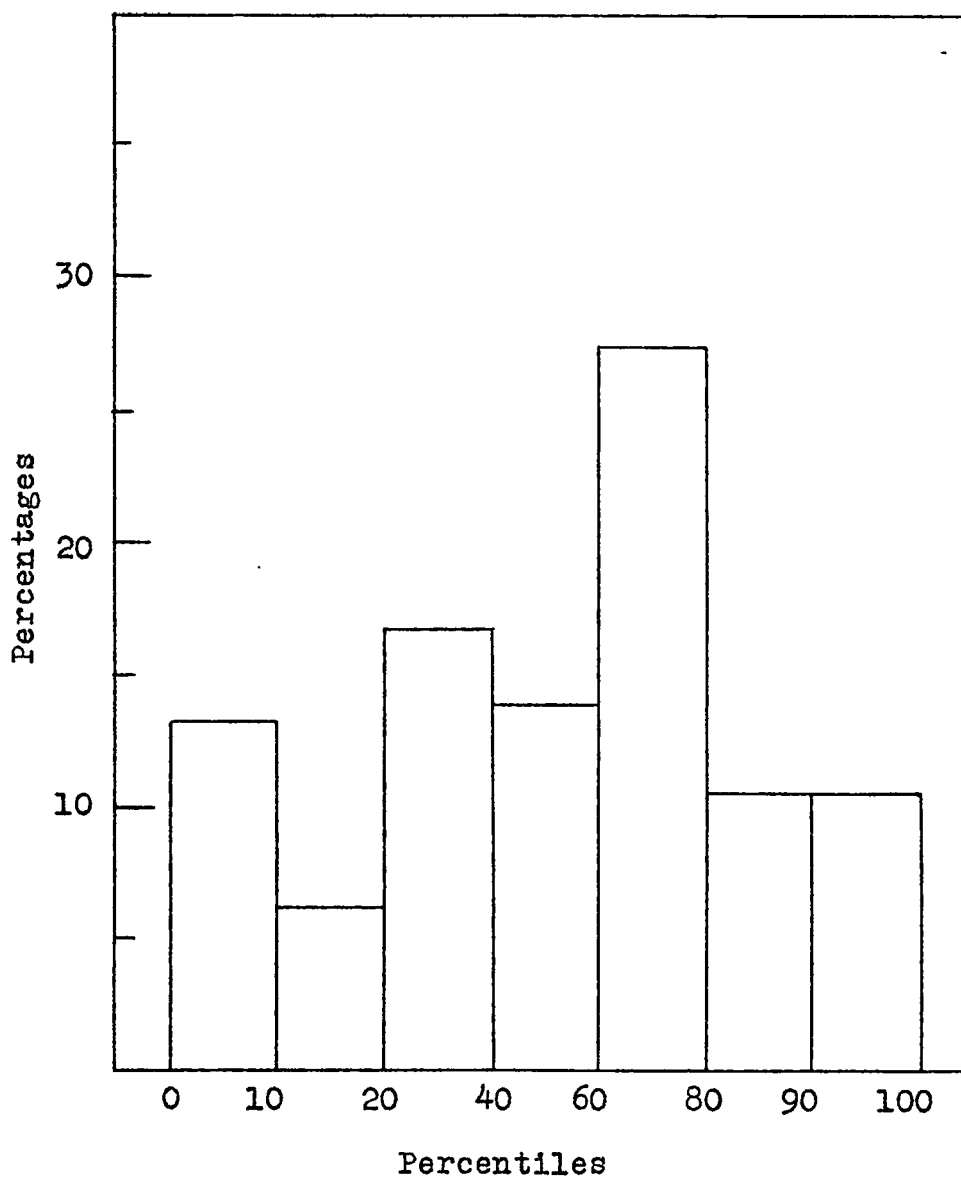


FIGURE 13
DISTRIBUTION OF PERCENTAGES
STABLE TRAIT--
UNDERACHIEVERS

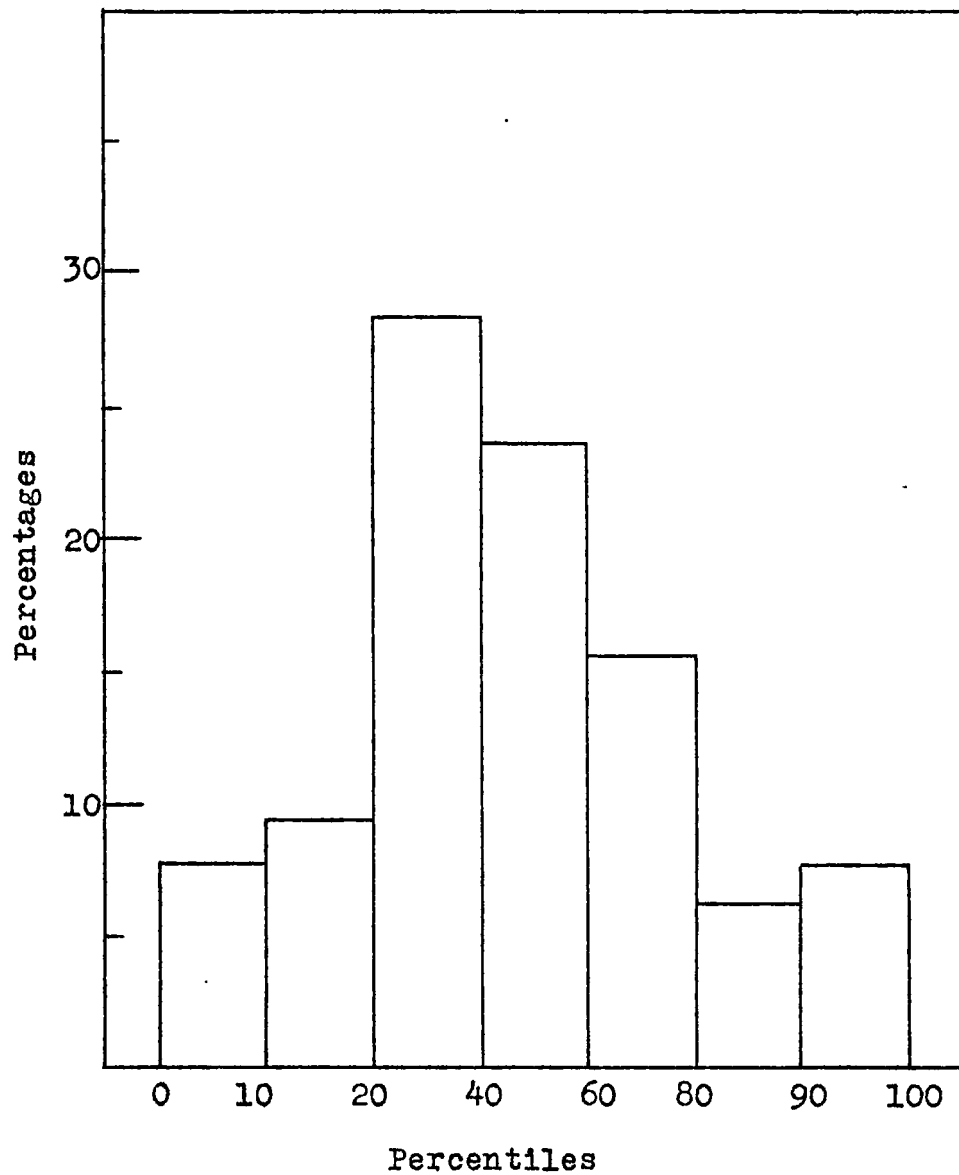


TABLE XXII
DISTRIBUTION OF PERCENTAGES
SOCIABLE TRAIT

	Achievers	Underachievers
Very High 90-100	6.2	6.3
High 80-89	10.7	9.5
High Average 60-79	8.1	15.8
Average 40-59	23.2	22.2
Low Average 20-39	20.5	28.5
Low 10-19	11.6	11.1
Very Low 0-9	19.6	6.3

FIGURE 14
DISTRIBUTION OF PERCENTAGES
SOCIABLE TRAIT--
ACHIEVERS

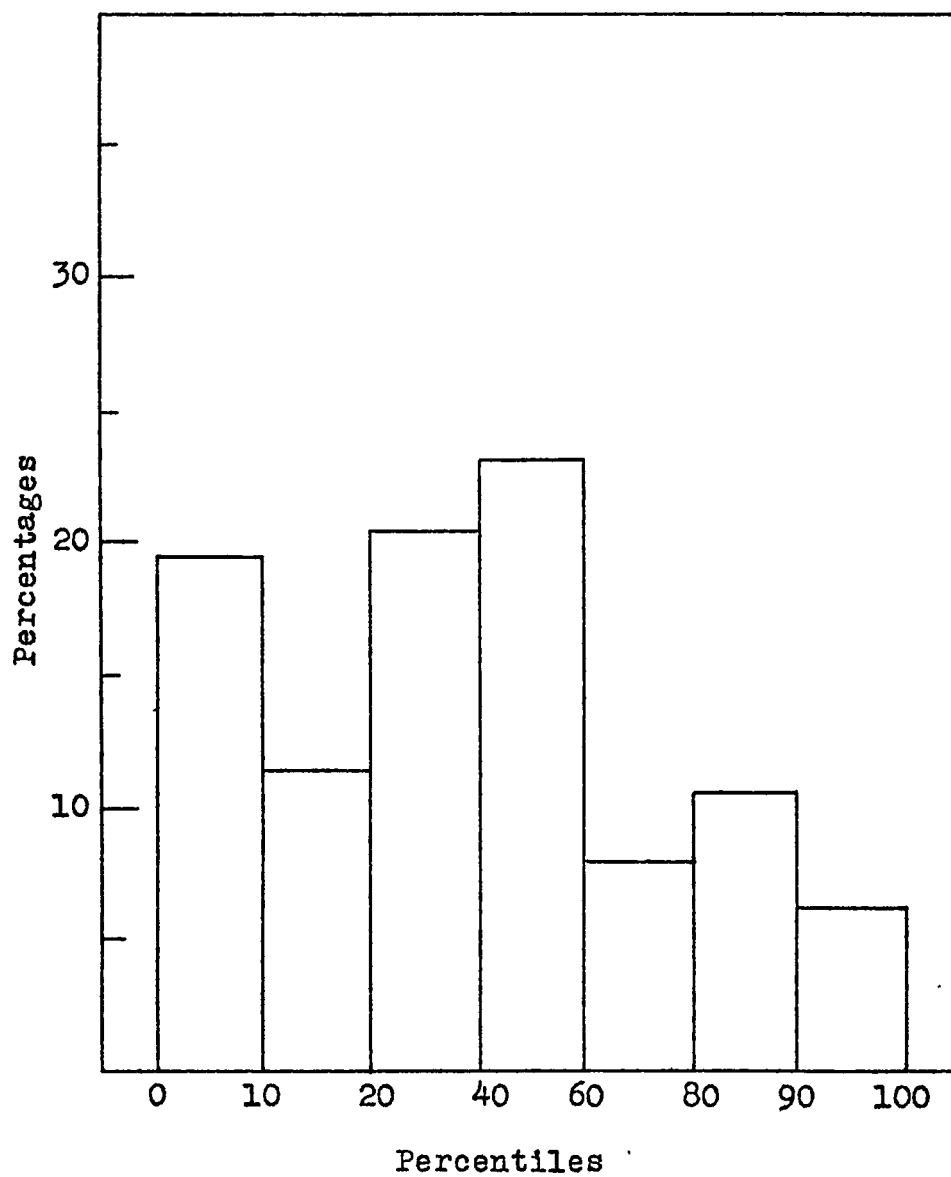


FIGURE 15
DISTRIBUTION OF PERCENTAGES
SOCIABLE TRAIT--
UNDERACHIEVERS

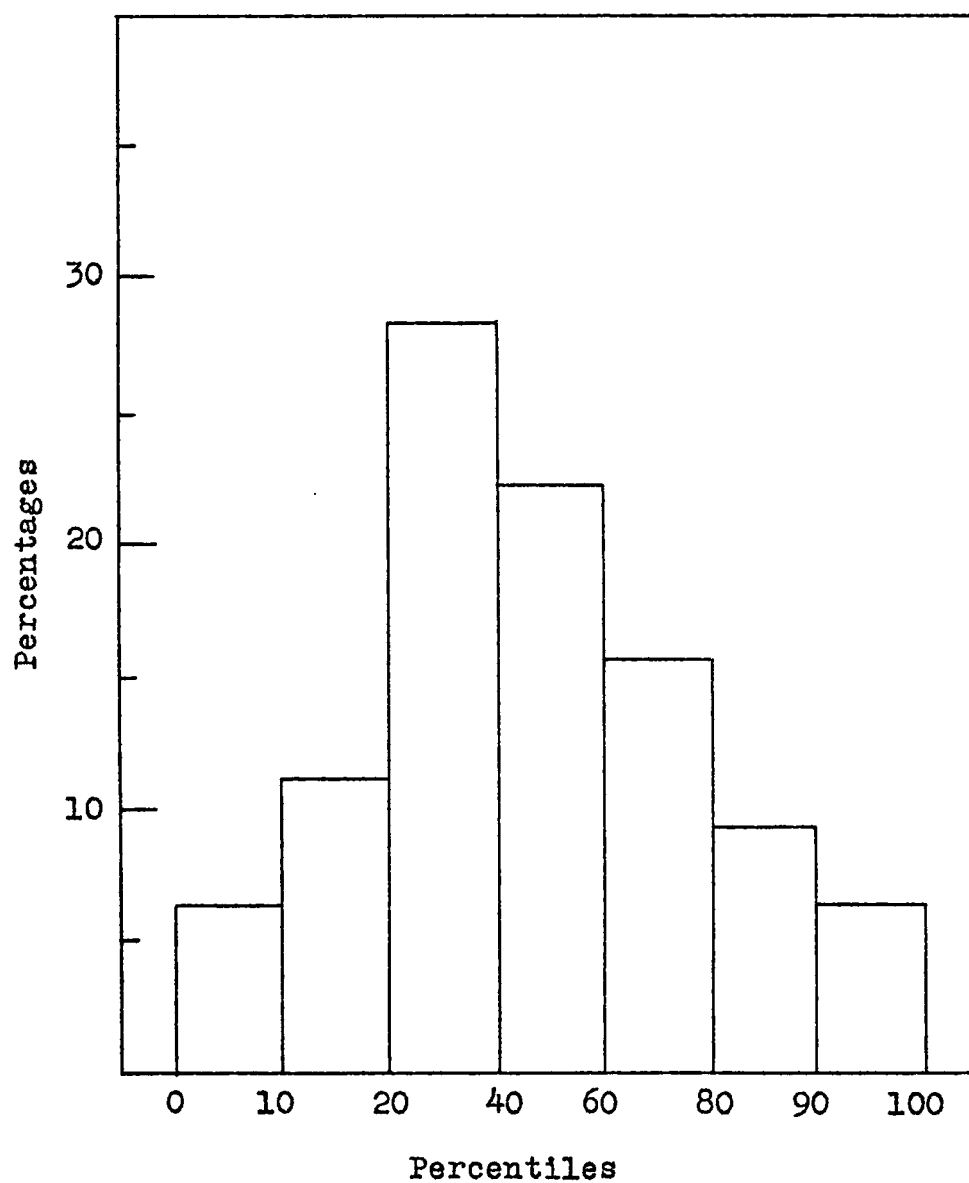


TABLE XXIII
DISTRIBUTION OF PERCENTAGES
REFLECTIVE TRAIT

	Achievers	Underachievers
Very High 90-100	27.5	26.3
High 80-89	20.5	12.3
High Average 60-79	16.8	18.9
Average 40-59	9.9	15.8
Low Average 20-39	10.7	12.3
Low 10-19	6.2	6.3
Very Low 0-9	8.1	7.9

FIGURE 16
DISTRIBUTION OF PERCENTAGES
REFLECTIVE TRAIT--
ACHIEVERS

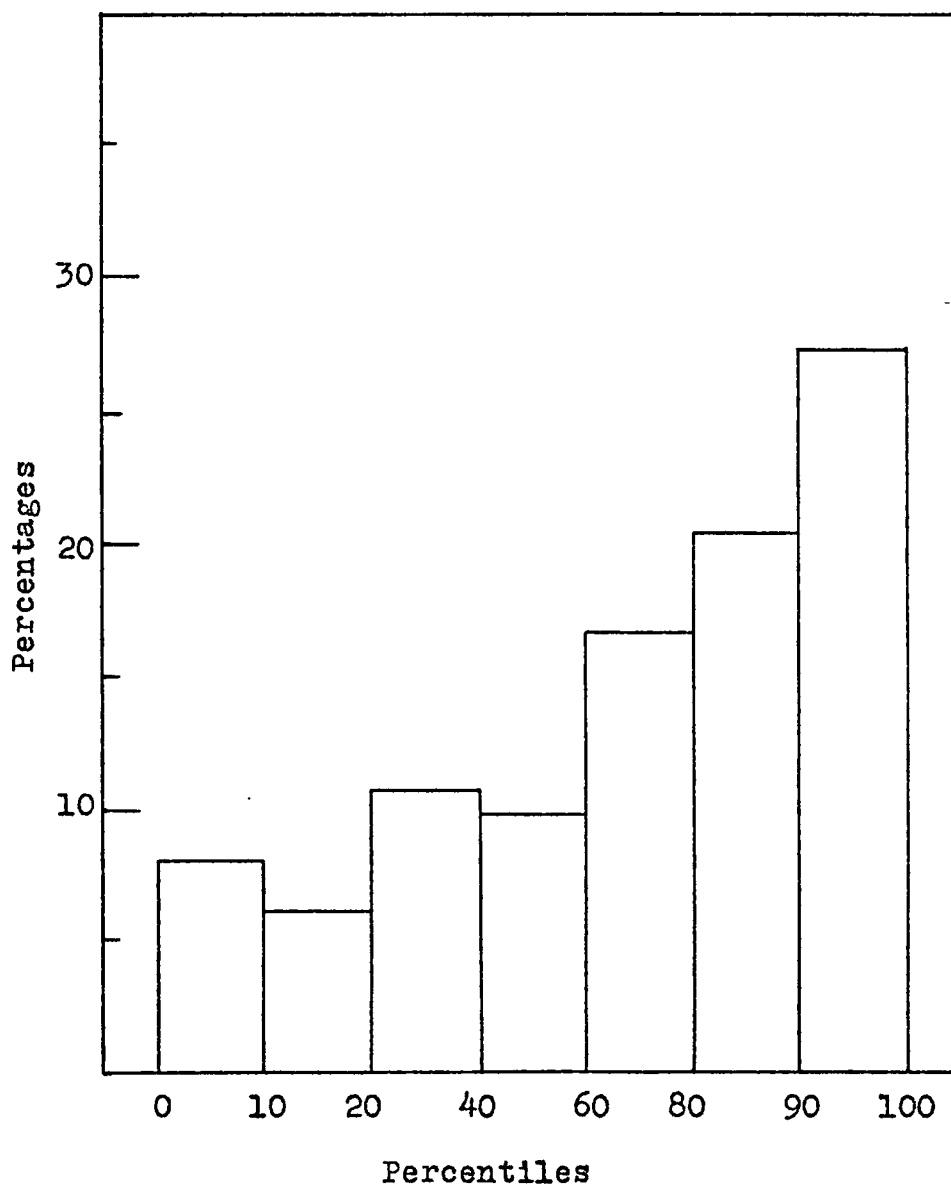
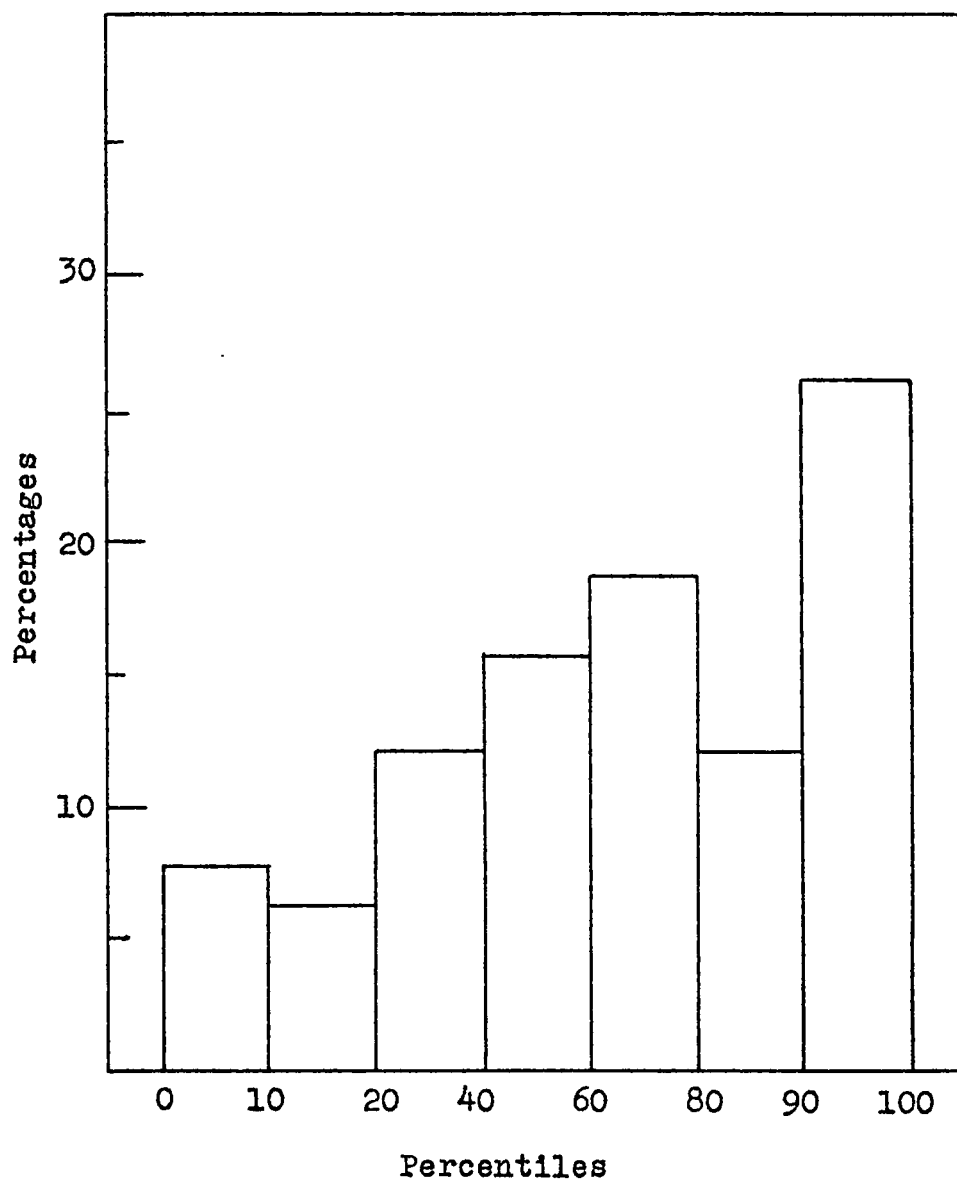


FIGURE 17
DISTRIBUTION OF PERCENTAGES
REFLECTIVE TRAIT--
UNDERACHIEVERS



IV. SCORES AT THE FIFTIETH PERCENTILE

A comparison of the percentage of students who scored at the fiftieth percentile on each trait revealed that more achievers than underachievers marked the average percentile in active, vigorous, stable, and social. More under-achievers than achievers had average percentile scores for impulsive, dominant, and reflective. Refer to Table XXIV, page 91.

Scores were distributed to the degree that neither achievers nor underachievers could be labeled as strongly characterized by a definite temperament trait.

TABLE XXIV
PERCENTAGES OF STUDENTS AT THE FIFTIETH PERCENTILE
THURSTONE TEMPERAMENT SCHEDULE

	Achievers	Underachievers
Active	10.7	6.3
Vigorous	9.8	4.5
Impulsive	6.2	7.9
Dominant	8.1	11.8
Stable	9.8	6.3
Sociable	10.7	9.5
Reflective	2.7	5.5

CHAPTER VII

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this investigation was to study two selected groups of Bellaire Senior High School students during the academic year 1960-1961. Subjects were juniors and seniors whose Otis Intelligence Scores were between 110 and 125 and whose scholastic ranks were within the upper limits of 5.0 and 4.5 or within the lower limits of 2.9 and 2.0. The higher performing group was called "achievers"; the lower performing group was called "underachievers." Attention was directed to identification of scholastic aptitudes, vocational preferences, values, and temperament traits of the two groups. The Verbal Reasoning, Numerical Abilities, Abstract Reasoning, Space Relations, and Mechanical Reasoning tests of the Differential Aptitude Tests were administered to analyze the scholastic aptitudes of the students.

I. SUMMARY

Analysis of results. The achievers were those students who had been productive in their academic studies in high school as had been expected. Of the tests administered significant differences found in this study revealed that the achievers possessed higher aptitudes in the verbal

and numerical areas than the underachievers. Although the mean scores computed from the results of the Abstract Reasoning test did not indicate any significant differences between the two groups, the achievers ranked above the underachievers. A comparison of the mean scores on the Space Relations and Mechanical Reasoning tests showed a significant strength for the underachievers.

The Verbal, Numerical, and Abstract tests were designed to measure "general intelligence." The results of these tests pointed to the superiority of the achievers; however, the only statement that could be made was that a difference between the two groups did exist. The students at the outset had been selected from a limited intelligence range. The mean intelligence quotient score of the achievers was 119.6; of the underachievers, it was 114.6. Both groups were above the average upper limit of 110. In a combination of tests to measure special abilities in dealing with things, the Space Relations and Mechanical Reasoning tests evidenced significant differences between the study groups. In these skills the underachievers were found to be more able than the achievers.

The mean scores of achievers and underachievers for all tests were above the mean scores of the validating samples of the Differential Aptitude Tests. The distribution of scores above the fiftieth percentile, the sixtieth

percentile, and the ninetieth percentile of all tests showed that achievers and underachievers were, in general, superior to the average of the students represented in the Differential Aptitude Tests study. Differences of percentages of the achievers and underachievers of this investigation were comparable to the differences of their mean scores of the same tests.

The Kuder Preference Record--Vocational provided a range of scores in the interest areas of outdoor, mechanical, computational, scientific, persuasive, artistic, literary, musical, and clerical. Girl achievers appeared to differ from girl underachievers more than did boys of the groups. Girl achievers tended to mark extremes of the ranges of preference; girl underachievers registered only four areas below the tenth percentile and none above the ninety-fourth percentile. Boy achievers were observed to have a low interest in social service; whereas boy underachievers scored a wide range in this area. Ranges of other scores did not differ for boys. In comparing percentage distributions it was noted that achievers frequently scored in the extremes. In six of the ten areas more of the achiever group recorded interest above the ninetieth percentile than the underachiever group; in seven of the areas the same was true for scores below the tenth percentile. Distribution of first preference for the two groups differed. Computational,

however, was first for the achievers and third for the underachievers. Mechanical and Clerical were the last two preferences for both groups. The strongest interest indicated was in the area of computational by the achievers. Selections of occupational interest were not significantly clustered to indicate a distinct preference for either group.

The results of the Allport-Vernon Study of Values indicated worth for items which motivated attitudes in six basic interests of the theoretical, the economic, the aesthetic, the social, the political, and the religious. An examination of the differences in mean scores of the achievers and underachievers revealed that responses for boys of the two groups differed more than responses of girls. A comparison of boy responses and girl responses with total responses showed larger mean differences for boys than for the combined groups. Boy achievers placed high esteem on the theoretical, the religious, and the economic in order named. Boy underachievers ranked the economic, the theoretical, and the aesthetic as their values of most importance. Lowest worth was assessed to the aesthetic for achiever boys and to the social for underachiever boys. High mean differences were noted for boys in all areas except the theoretical and the political. Girl achievers presented higher means in every area than girl underachievers. Girls

of both groups regarded the religious as the area of highest value. Although all girls marked the theoretical as least valuable to them, the achiever girls recorded a mean score 8.5 points above the underachiever girls. This was the largest difference of any of the scores for girls. Observation was made of the 5.1 point difference between mean scores for girls in the social; achiever girls had the higher score.

Because of the influence of the difference between the value ratings of the boys of the two groups, total achievers and underachievers were found to have different attitudes in each basic interest. The value differences were divided between the groups. Achievers outscored underachievers in the theoretical, the social, and the religious. The underachievers were first in the economic, the aesthetic, and the political. The religious for the achievers and the economic for the underachievers were values of highest regard. In comparison of extreme scores it was found that underachievers tended to mark outside the ranges of eighty-two per cent and fifty per cent of all upper and lower levels of scores on this values scale. Extreme scores for the achiever group were noted in the religious column. Although average scores were low, the achievers appeared to present somewhat larger numbers of students at the exact average score.

Description of temperament of the subjects of this investigation was based on the seven traits identified as active, vigorous, impulsive, dominant, stable, social, and reflective of the Thurstone Temperament Schedule. High scores established the basis for trait assessment. Levels of scores ranged from the very high to the very low. Distribution of percentages of scores provided implications of traits which appeared to characterize the two groups. Neither group emerged with a strongly emphasized temperament trait.

Underachievers tended to be high in the active and vigorous traits. For the achievers 47.4 per cent for the active and 41 per cent for the vigorous were within average and low average divisions. The comparative picture for the impulsive trait presented an interesting distribution of scores. Neither group seemed to possess a strong tendency to be impulsive. In the total average band the achievers registered 44.3 per cent, while the underachievers had 55.4 per cent. Small numbers of students were found to have high scores. The underachievers did not have a score above the eighty-ninth percentile. Low scores seemed to dominate both groups, but the achievers scored 29.1 per cent below the ninth percentile.

In the dominate trait, the achievers tended to differ within the group, with each level showing more than ten per

cent. The underachievers disclosed over one-fourth of the total number in the average column. In relation to this item, it was also noted that 11.8 per cent of the underachievers scored at the fiftieth percentile of this trait. The achievers evidenced a slight strength on high scores, in general. On the basis of relative numbers of high scores it would appear that more achievers than underachievers could be described as stable, with forty-nine per cent scoring above the sixtieth percentile, which represented high average through very high scores on the scale. The underachievers offered thirty per cent in the same division. The underachievers seemed to fall below the thirty-ninth percentile.

The comparison of the two groups on the social trait presented a picture of even distribution with the exception of a larger percentage of very low scores for the achievers. Little difference appeared to exist between the relative scores in the other percentile bands. Almost one-fourth of each group was considered in the average range. Neither achievers nor underachievers were high in sociability.

In respect to the reflective trait, inference was that both achievers and underachievers could be characterized by this trait. For the achievers this appeared to be the strongest trait, with 64.8 per cent scoring above the sixtieth percentile. The underachievers could be

characterized by this trait, also, with 59.5 per cent in this bracket. The underachievers, however, would seem to be contradictory as a group, because their most outstanding trait was the active, with 63.3 per cent recorded at high average or above. Both groups had relatively few scores below low average.

Description of the achievers. The achiever group was composed of students who had received high teacher marks in school subjects. Their scholastic averages had placed them in the top fifteen per cent of their class ranks. They had succeeded in the academic situation as had been expected. This group was characterized by high aptitudes in the verbal and numerical areas. These students evidenced ability to think clearly, to understand word concepts, to generalize ideas, to reason and compute arithmetically, to manipulate number relationships, and to analyze quantitative material. In these mental tasks the achievers performed at a higher level than the underachievers. The achievers were well equipped to deal with non-verbal material in the area of abstract reasoning; they were able to reach logical conclusions to the problems which they encountered. When confronted with the necessity to visualize concrete material, to think in spatial terms, and to analyze problems based on mechanical and physical principles, the achievers did not evidence to

the degree of skill, facility, and understanding that the underachievers did. It can be stated, however, that the achiever group did record commendable scores.

Interests of achievers varied. In general these students tended to register numbers at the extremes of the range of the possible scores. Boy achievers were characterized by a low interest in social service. Over fifty per cent of this group indicated preferences at or above the fiftieth percentile in five of the ten interest areas. Occupations related to computational and scientific interests appeared to have the first preference of many achievers. It was not reasonable to characterize the achievers by a specific vocational preference.

Inference from an examination of the achiever group profile for attitude ratings was that achievers focused esteem on the religious value. Other value scores tended to the average of the scale. Achievers did not resemble a specific "spranger type." Boy achievers could be characterized as theoretical in dominant interest. Girl achievers were not extremely high or low in any attitude.

In assessing the relative strength of temperament traits indicated by the achievers, observation may be made that almost half of this group scored very high in the reflective trait. More achievers appeared to be characterized by this trait than any other phase of temperament measured.

In other areas, inference was that few achievers were highly active, vigorous, impulsive, or sociable. About half of this group ranked above average in characteristics of dominance and stability.

Description of the underachievers. The underachiever group was composed of students who had received low teacher marks in school subjects. Their scholastic averages placed them in the fourth quarter of their class rank. They had not succeeded in the academic situation as had been expected. This group was characterized by high aptitudes in understanding spatial relations and in solving problems based on simple familiar mechanisms of the environment. In these special abilities of dealing with things--rather than with people or words--the underachievers were more adept than the achievers. Underachievers recorded better than average abilities in logical thinking, verbal concepts, and numerical reasoning and computation.

In selecting items indicative of vocational interest the underachiever group expressed preference for occupations related to outdoor, literary, computational, and social service areas. Although interest in outdoor occupations seemed to be first choice of many underachievers, the preference was not strong enough to be regarded as characteristic of this group.

Underachievers also resisted a characteristic "spranger type" on the values scale. These young people had a tendency to place high or low emphasis on value categories. Boys scored unexpected highs in two contrasting attitudes--the theoretical and the aesthetic. Girls, however, recorded the lowest of any scores in theoretical. The group therefore could not be described as representative of a particular value.

As to temperament traits, the underachiever group may be considered to be somewhat active and vigorous. Another trait evidenced by these students was the reflective. They tended to be average to low average in the dominant, social, and stable characteristics. Scores on the impulsive trait were low enough to suggest that the underachievers were not by nature of a carefree disposition or prone to make quick decisions.

II. CONCLUSIONS

From the descriptions of the achievers and the underachievers of this study, the following conclusions have been reached:

1. Achievers were superior in aptitudes of verbal and numerical reasoning.
2. Achievers were as able to reason logically as underachievers.

3. Underachievers were superior in spatial and mechanical aptitudes.

4. The scores on the Differential Aptitude Tests indicated that ninety per cent of the achievers and seventy per cent of the underachievers were potentially able to do college work.

5. Vocational preferences were not clearly defined by either group, although achievers appeared to be interested in occupations of a computational content.

6. Achievers and underachievers showed high esteem for the religious value.

7. Underachievers tended to extreme scores at the upper and lower level of the range of values.

8. Both groups were characterized by the reflective trait.

9. More underachievers than achievers seemed to be temperamentally active and vigorous.

10. The two groups were low in impulsiveness.

11. Underachievers as a group evidenced abilities to make higher grades than they had made to date.

12. Causes of underachievement of these students were not directly related to the characteristics studied.

III. RECOMMENDATIONS

The findings of this study have influenced the writer to make the following recommendations:

1. Scholastic aptitude tests because of their provision of facts about individual abilities should be included in the high school testing program.
2. Over ninety per cent of the achievers and at least seventy per cent of the underachievers of this study should be encouraged to go to college.
3. Underachievers with special abilities merit individual counseling for the purpose of their working toward productive behavior.
4. Administrators, counselors, and teachers need to work with parents and community agencies to challenge all students to try to attain maximum performance.
5. Vocational preference checklists and temperament scales should be provided for students who need and/or want to try to understand themselves better.
6. The curriculum should be flexible enough to enable students to prepare for college, and to offer training for terminal students.
7. Able underachievers should be informed of their special aptitudes and encouraged to analyze themselves.

8. Able achievers should be informed of their special abilities and encouraged to plan their higher education in related fields.

Because underachievement of the able individual is a problem which will remain a challenge to students, educators, and parents, continued research in this area is a necessity. Studies have failed to offer any answers specific enough to facilitate advancement in the direction toward solution of the enigma. Emphasis has been focused on many factors which influence the pupil toward or away from learning in the formal sense. Although underachievers have not been able to succeed in the classroom situation, they have gained knowledge not measured by teacher marks.

Motivational forces, curriculum, economic and social conditions, personality structure, and others provide bases for the search for insight into causation of failure. The feeling by this writer is that additional investigations should be oriented toward the self-concept of the underachiever. Suggestion is that the underachiever has a low regard for himself, primarily because he has not known the satisfaction that can be experienced by academic success.

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APPENDIX

February, 1961

Dear Mr. and Mrs. _____:

Your (son, daughter) has been selected to participate in a guidance study. This research project will be conducted under the graduate school of the University of Houston.

The plan will include a battery of tests which will be administered after school hours or on Saturday. The results will be confidential and will be interpreted to each student and his parents.

The tests included are in the areas of scholastic aptitude, personality, and vocational interest and aptitude. You are welcome to examine any test before it is administered. In addition to the tests I shall need data on each individual in the study. This, too, will be handled in a confidential manner.

The purpose of the study is to attempt to determine certain factors possessed by students in relation to their degree of achievement. It is hoped that the results will be beneficial to the students who are tested and to counselors and teachers who work with our young people. The principal of Bellaire Senior High School is conversant with the program and in full agreement with the over-all plan.

I shall be happy to answer any questions which you might have concerning my procedure and purpose.

If you will permit _____ to participate in this research study, please sign in the space below and return this form to me.

Sincerely,

Office number: M07-3751 LaVerne Carmical, Counselor
Home number: H08-6554 Bellaire Senior High School

_____ has my permission to participate in the research study conducted by LaVerne Carmical.

Signed: _____
Preferred time: ☐ After school
(Check one) ☐ Saturday

The first test will be administered Thursday afternoon, March 2, at 3:15 p.m.

TEST SCHEDULE

BELLAIRE SENIOR HIGH SCHOOL CAFETERIA

TESTS

1. Timed Tests--Differential Aptitude Tests

Verbal Reasoning
Numerical Reasoning
Abstract Reasoning
Space Relations
Mechanical Reasoning

Approximately thirty minutes each

2. Untimed Tests

Allport-Vernon Study of Values
Kuder Preference Record--Vocational
Thurstone Temperament Schedule

Approximately thirty minutes each

SCHEDULE

Saturdays at 9:15 a.m.

March 4
March 11
March 25

Afternoons at 3:15 p.m.

March 8 and 9
March 15 and 16
March 22 and 23
March 30

Note: Tests may be taken at any of the times indicated. One, two, or more may be taken on one day. A student may come to be tested on any testing date. Please keep this paper to mark the names of the tests as you complete them. Drop by my office for additional information.

LaVerne Carmical, Counselor
Bellaire Senior High School

PERSONAL REPORT

Differential Aptitude Tests (scholastic)

Sub-tests	Score (reported in percentiles)
Verbal	_____
Numerical	_____
Space Relations	_____
Abstract Reasoning	_____
Mechanical	_____

Values	Score (based on average of 40)
Theoretical	_____
Economic	_____
Aesthetic	_____
Social	_____
Political	_____
Religious	_____

Temperament	Score (based on average of 50)
Active	_____
Vigorous	_____
Impulsive	_____
Dominant	_____
Stable	_____
Sociable	_____
Reflective	_____

Kuder Vocational Preference

Areas of Interest	High Number Preference
Outdoor	_____
Mechanical	_____
Computational	_____
Scientific	_____
Persuasive	_____
Artistic	_____
Literary	_____
Musical	_____
Social Science	_____
Clerical	_____

LaVerne Carmical, Counselor
 Bellaire Senior High School