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COLEMAN LAVAN RALEY

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PERSONALITY TRAITS OF HIGH-ACADEMIC ACHIEVERS

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APPROVED BY

Henry Angelino

O. J. Tupper

F. F. Gaither

A. Heilman

Glenn R. Snider

DISSERTATION COMMITTEE

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PERSONALITY TRAITS OF HIGH-ACADEMIC ACHIEVERS AT OKLAHOMA BAPTIST UNIVERSITY, 1958-1959

CHAPTER I

INTRODUCTION

In a recent television interview Arnold J. Toynbee commented that we are now entering the "age of the egg-head." He indicated that although leaders of governments and industries may not like the intellectual, they must have him in order to survive. Walter J. Kaulfers reported on a world tour which he made for the purpose of observing the educational systems of other nations. His report ended with the following statement.

> If the experience of flying around the world led to any one impression sufficiently strong to supersede all others, it is that what most Americans have heretofore considered average is no longer good enough. In order to have men to match the future, we must increase the range and power of our knowledge, skills, and personal character just as we have increased the range and power of our cars, airplanes, and guns. Anything less would be short sighted of a generation that saw the day "When the power of the sun fell into the hands of men."[1]

While the statements of these two observers may be highly charged with emotion, we would agree that considerable value will be placed upon

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[1]Walter V. Kaulfers, "Average Is No Longer Good Enough," The Educational Forum, XXI, (1957), 313.

academic achievement and intellectual leadership during the productive lives of those now in colleges and public schools. Although not all of those who are high-academic achievers at the secondary school and college undergraduate levels can meet most criteria for "intellectual," it is largely from this group that we can expect intellectual leadership.

Need for This Study

With the increasing demand for broadly educated and highly trained persons in all walks of life, it is essential that we learn as much as we can about the high-achieving student. This knowledge of the personality characteristics of the high-achieving student is sought in order that we might give him more adequate guidance and in order that we might more effectively guide children at the elementary and secondary school levels in the development of those personality characteristics which contribute to the more effective use of their mental abilities.

The Problem

What are the non-intellectual personality traits of the high-academic achiever and on which traits do high-academic achievers differ from moderate-academic achievers when intelligence is held constant?

Purpose of This Study

The purpose of this study is to isolate the non-intellectual personality traits of the high-academic achiever at the college level. It will be necessary to determine the differences between the high achievers and the moderate achievers and the directions of those differences on the

traits measured. Differences between sub-groups isolated by sex, academic achievement, and academic ability as described later will be noted also.

Definition of Terms

High-academic achiever will designate those students who have achieved a minimum quality-point average of 3.5 computed on the basis of 4.0 quality points for each semester hour with a grade of "A", and 3.0 quality points for each semester hour with a grade of "B", during the first semester of the academic year 1958-1959, in the College of Liberal Arts of Oklahoma Baptist University. A grade of "C" on any course automatically eliminates the student from the high-achieving group.

Moderate-academic achiever will designate those students who have achieved a quality-point average of between 2.0 and 2.5 computed on the basis of 2.0 quality points for each semester with a grade of "C", and 1.0 quality point for each semester hour with a grade of "D". Quality points for grades above "C" are described above. A grade of "F" on any course automatically eliminates the student from this group. The students in this group are in the College of Liberal Arts of Oklahoma Baptist University and assignments to this group are made on the basis of grades earned during the first semester of the academic year, 1958-1959.

Non-intellectual personality traits will designate those traits or variables measured by the Edwards Personal Preference Schedule (hereafter called the Edwards PPS) and the Allport-Vernon-Lindzey Study of Values (hereafter called the AVL Study of Values), along with four variables (Interest Maturity, Occupational Level, Specialization Level, and Masculinity-Feminity) as measured by the Strong Vocational Interest Blank for Men, Form M, (hereafter called the Strong VIB).

Intelligence, or academic ability, will be designated by the gross scores achieved on The American Council on Education Psychological Examination for College Freshmen (hereafter called The ACE Psychological Examination) at the time of admission as freshmen.

Hypotheses

1. There will be no difference between the high-academic achiever and the moderate-academic achiever on the following variables as measured by the Edwards PPS:
   a. Achievement
   b. Deference
   c. Order
   d. Exhibition
   e. Autonomy
   f. Affiliation
   g. Intraception
   h. Succorance
   i. Dominance
   j. Abasement
   k. Nurturance
   l. Change
   m. Endurance
   n. Heterosexuality
   o. Aggression

2. There will be difference between the high-academic achiever and the moderate-academic achiever on the following variables as measured by the AVL Study of Values:
   a. Theoretical
   b. Economic
   c. Aesthetic
   d. Social
   e. Political
   f. Religious

3. There will be no difference between the high-academic achiever and the moderate-academic achiever on the following variables as measured by the Strong VIB:
   a. Interest maturity
   b. Occupational level
   c. Specialization level
   d. Masculinity-Femininity

4. There will be no differences between the high-achieving male students and moderate-achieving male students on the variables listed above in hypotheses 1, 2, and 3.

5. There will be no differences between the high-achieving female students and moderate-achieving female students on the variables listed above in hypotheses 1, 2, and 3.

6. There will be no differences between the following Sub-groups on the variables listed above in hypotheses 1, 2, and 3:

   a. Sub-group IA (high-achieving high-ability students) and Sub-group IB (high-achieving moderate-ability students);

   b. Sub-group IIA (moderate-achieving high-ability students) and Sub-group IIB (moderate-achieving moderate-ability students);

   c. Sub-group IA (high-achieving high-ability students) and Sub-group IIA (moderate-achieving high-ability students);

   d. Sub-group IB (high-achieving moderate-ability students) and Sub-group IIB (moderate-achieving moderate-ability students);

   e. Sub-group IB (high-achieving moderate-ability students) and Sub-group IIA (moderate-achieving high-ability students);

   f. Sub-group IA (high-achieving high-ability students) and Sub-group IIB (moderate-achieving moderate-ability students).

Procedure

Matched-Group Technique

Two groups that are matched for sex, academic classification, and mental ability will be used in this study. Group I will consist of high-academic achievers and Group II will consist of moderate-academic achievers as defined above on page 3.

Both Groups I and II are distributed according to sex and academic classification in the following manner: Seniors - 13 (8 male, 5 female); Juniors - 17 (5 male, 12 female); Sophomores - 12 (4 male, 8 female); Freshmen - 13 (3 male, 10 female). There were a total of 75 students who made a quality-point average of 3.5 for the semester. However, since 18 of these are transfer students for whom no ACE Psychological Examination

scores are available, they cannot be used in this study. Also, the highest gross score on record (170) was achieved by the son of a foreign missionary who has lived in several Oriental countries and who has had a private tutor most of his life. The lowest score (93) among the high-academic achievers was made by a Chinese girl who was somewhat handicapped both from the standpoint of language and culture when the ACE Psychological Examination was taken. For these reasons both students were eliminated. This leaves a total of 55 high-academic achievers to be used in this study.

TABLE 1

COMPARISON OF GROUPS I AND II ON THE ACE PSYCHOLOGICAL EXAMINATION GROSS SCORES

	Group I	Group II
N	55	55
Range	157-97 = 60	161-99 = 62
Percentiles*	98-34	99-37
Mean	124 ± 2.27	123.35 ± 2.05
Median	123	122.33
S.D.	16.65 ± 1.57	15.45 ± 1.47
$S.D.^2$	277.22	238.70
Q	12.22	12.90

*Four-year college norms, American Council on Education Psychological Examination for College Freshmen, Norms Bulletin, (Princeton: Educational Testing Service, 1950), 15-19.

The comparability of Groups I and II with respect to academic abilities can be seen by examining Table 1. There are no differences between the two groups either in their central tendencies or in their variabilities.[1]

[1]See Appendix I for the ACE Psychological Examination Gross scores of both groups according to sex and academic classification.

Holding the factor of ability constant, the high- and moderate-achieving male students (Hypothesis 4) as well as the high- and the moderate-achieving female students (Hypothesis 5) in Groups I and II are compared. Then Groups I and II (total) are compared. (Hypotheses 1, 2, 3).

For the purpose of further comparisons two sub-groups in each of the major groups were isolated. Sub-groups IA and IB consist of the upper 27 percent and the lower 27 percent[1] of the students in Group I as measured by the ACE Psychological Examination. Sub-group IA may be considered high-ability high-achievers, and Sub-group IB, moderate-ability high-achievers. Likewise, Sub-groups IIA and IIB consist of the upper and the lower 27 percents of the moderate-achievers defined similarly. There are 15 subjects in each sub-group, and the comparability of the high-ability and the moderate-ability students in the two major groups can be seen in Table II.

TABLE 2

COMPARISONS OF SUB-GROUPS IA AND IIA, IB AND IIB ON THE ACE PSYCHOLOGICAL EXAMINATION GROSS SCORES

	IA	IIA	IB	IIB
N	15	15	15	15
Range	157-135 = 22	161-135 = 26	111-97 = 14	111-99 = 12
Percentiles*	98-87	99-87	56-34	56-37
Mean	145.40	144.6	105.13	107.67
Median	144	145	106	105
S.D.	8.24	8.76	4.17	3.82
$S.D.^2$	67.86	76.71	17.43	14.57
Q	5	6	3	3

*Ibid.

[1] Arvil S. Barr, Robert A. Davis, and Palmer O. Johnson, Educational Research and Appraisal, (New York: J. B. Lippincott Co., 1953), 94.

From the data presented in Table 2, it may be inferred that the students in both Sub-groups IA and IIA have high-academic abilities and should be expected to achieve high-academic standings. It can be inferred also that the students in Sub-groups IB and IIB have from average to low-average academic abilities and should not be expected to achieve higher than "average" grades which in most colleges would be a "C" average. This is not the case, however. Sub-groups IA and IB achieved the minimum of a "B+" average (3.5 quality points on a 4.0 scale), while Sub-groups IIA and IIB achieved a "C" average (2.0-2.5 quality points on a 4.0 scale).

A secondary concern of this study is to determine, if possible, which personality traits as measured by the Edwards PPS, the AVL Study of Values, and the Strong VIB are associated with high-academic achievement at different levels of academic ability. The terms "under-achievers" and "over-achievers" may be used to describe Sub-groups IIA and IB, but there are numerous factors other than academic ability that relate to high academic achievement.

Holding the factor of achievement constant to determine whether whatever differences found may be a function of ability, the upper 27 percent and lower 27 percent of each of the major groups as measured by the ACE Psychological Examination are compared: Sub-group IA (High-achieving high-ability students) with Sub-group IB (High-achieving moderate-ability students); and Sub-group IIA (moderate-achieving high-ability students) with Sub-group IIB (moderate-achieving moderate-ability students). (Hypotheses 6a and 6b, respectively).

Because of the rather wide range of academic abilities in each of the two groups of subjects, an effort is made to determine the effects

of both high and moderate ability when related to different levels of achievement. Holding the factor of ability constant at the two extremes, the following comparisons are made: Sub-group IA (high-achieving high-ability students) with Sub-group IIA (moderate-achieving high-ability students) (Hypothesis 6c); and Sub-group IB (high-achieving moderate-ability students) with Sub-group IIB (moderate-achieving moderate-ability students). (Hypothesis 6d).

Consideration is then given to the two sub-groups that might be classified as over-achievers and under-achievers. Sub-group IB (high-achieving moderate-ability students) are compared with Sub-group IIA (moderate-achieving high-ability students). (Hypothesis 6e).

The factors of achievement and ability are combined to determine their joint effects. Sub-group IA (high-achieving high-ability students) are compared with Sub-group IIB (moderate-achieving moderate-ability students). (Hypothesis 6f).

The Data

The scores on the ACE Psychological Examination and the quality-point averages of students in Groups I and II have been made available by the Office of Admission and Records of Oklahoma Baptist University. All entrance examinations are administered by the Director of Personnel. The Edwards PPS, the AVL Study of Values, and the Strong VIB were administered to all subjects during the month of April, 1959. The answer sheets were scored by the Machine Accounting Service of the University of Oklahoma.

Statistical Treatment

The median test, which is a useful procedure for determining differences between the central tendencies of two groups of scores with relatively

small numbers and with unknown distributions, is applied to the data for Groups I and II holding the factor of sex constant and to the data for the two sexes combined.[1] The same test is then applied to the data for the several sub-groups in the various combinations as described above. The procedure for applying the median test involves computing the combined median for the two sets of scores, dichotomizing the scores at the combined median for the two sets, and entering the data in a 2x2 contingency table. The columns indicate the group, or sub-group, for which the data are being presented (e.g. Group I, Group II) and the rows indicate the number of scores in each group that fall above the combined median and the number that fall at or below the combined median. The chi square test, corrected for continuity, is used to determine the significance of difference between the two groups or sub-groups being compared.[2]

Since a chi square of 1.07 with no degree of freedom is significant only at the .30 level of confidence, all chi squares of less than one are so designated without showing the exact value. The exact values of chi squares above one are shown. However, as a general rule, a probability of occurrence of .05, (chi square = 3.84) will be considered the minimum to permit the identification of group traits. The practice of adhering rigidly to arbitrary levels of significance (.05 or .01) is questioned by Siegel, who suggests that the researchers report the level of significance and let the reader decide whether to accept or reject the null hypothesis.[3]

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[1] Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences, (New York: McGraw-Hill Book Co., 1956), 111-116.

[2] Ibid., 111.

[3] Ibid., 9.

CHAPTER II

APPROACHES TO THE STUDY OF THE HIGH-ACADEMIC ACHIEVER

Early Approaches

One of the earliest systematic approaches to the study of persons of unusual ability was made by Sir Francis Galton in England during the 1860's and the decade following.[1] This outstanding scientist who made contributions to the fields of meteorology, heredity, and anthropology amassed factual data about persons who had gained distinction in numerous fields including those of jurisprudence, letters, statesmanship, music, scholarship, and even wrestling. He sought, among other things, to determine the various degrees of greatness and to answer the question of why some persons achieve unusual stature while others do not. Galton concluded that only a small percentage of persons in any generation can achieve real eminence, and that an analogy can be drawn between great ability and the physical dimensions of height and weight. Not that there is necessarily any correlation between unusual physical size and eminence, but that just as there are few persons of great physical stature, there are few also of great stature in other areas of achievement. Also,

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[1]Francis Galton, Hereditary Genius, (London: Macmillan, 1869), and English Men of Science, (London: Macmillan, 1874).

frequency of occurrence decreases as the standard is revised upward.

Galton found that there was a tendency for eminence to follow family lines, but at the same time he admitted that factors other than those of heredity might be operating. Since he was a pioneer in the field of genetics, it is expected that Galton would place considerable emphasis on the influence of hereditary factors. Subsequent research has tended to confirm many of his conclusions.

During the first decade of the Twentieth Century, James McKeen Cattell made a study of the one thousand outstanding men of science as rated by their contemporaries.[1] These men were living between the years of 1900 and 1915, and were selected on the basis of their contributions to their several disciplines. It was found that most of the outstanding scientists were children of professional men and that the laboring classes and farm families seldom produced men of eminence in this field. No claim was made, however, for a purely hereditary explanation of this phenomenon. It was recognized by Cattell that an enriched environment probably contributed to the development of these men.

Although he contributed less to the real understanding of persons of superior ability and more to the continuation of the "genius-insanity" myth, some mention should be made of Lombroso's publication of The Men of Genius in 1891.[2] Lombroso committed the error of selecting individual

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[1]James McKeen Cattell, "A Statistical Study of Eminent Men," Popular Science Monthly, Llll, 1903, 359-378, and American Men of Science, (New York: Science Press, 1921).

[2]Cited by Leta S. Hollingworth, Gifted Children: Their Nature and Nurture, (New York: Macmillan Co., 1926), 13-4.

cases to support his theory that genius is more highly correlated with insanity, mental and nervous disorders, along with disorders of speech and general physical weakness, than with any other phenomena. That this fallacy has persisted in the popular mind even to the present is evident when the writer is informed at least once each semester by students in introductory psychology classes that "everyone knows that the genius and the insane are separated by a very fine line."

The following couplet from the pen of Dryden probably gives comfort to persons of moderate ability:

> Great wits to madness are near allied
> And thin partitions do their bounds divide.[1]

Identification of the Gifted by Measurement

With the rapid growth of the measurement movement immediately following World War I, a different approach was developed. Instead of beginning with the adult who had demonstrated his outstanding ability in his chosen profession or vocation, efforts were made to identify the "gifted" child in the classroom in order to provide more adequately for his education. With the development of the Binet-Simon Scale in France in 1904 and 1905, and the subsequent translation into English by Goddard in 1916, there was made available to American educators and research workers an instrument for the early identification of children who might be expected to make meaningful contributions.[2] In 1921, Lewis M. Terman

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[1] John Dryden, Absalom and Achitophel, Part I, lines 164, 165.

[2] Lewis M. Terman and Maude A. Merrill, Measuring Intelligence, (Boston: Houghton Mifflin Co., 1937).

and a group of interested colleagues and graduate students at Stanford University initiated a monumental program of identifying and studying longitudinally 1528 children classified as "gifted" on the basis of Binet I.Q.'s, or those of other acceptable measures, of between 135 and 200.[1] Fourteen hundred seventy children (824 male and 646 female) were identified during the initial survey conducted between 1921 and 1923. In the follow-up study conducted during the school year 1927-1928, 58 sibling (33 male and 25 female) of those identified in the initial survey were added. Five volumes were published by this group under the general title of Genetic Studies of Genius between 1925 and 1959.[2]

Paralleling the work of Terman and his associates from the standpoint of both time and of approach is the work of Leta S. Hollingworth. Her first outstanding work dealt with the historical background of the problem and with various aspects of the work of identifying, characterizing, and educating gifted children.[3] Special attention was given to their

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[1]Binet -1070; Terman Group Test-428; National Intelligence Test-24; Army Alpha -6.

[2]Vol. I. Mental and Physical Traits of a Thousand Gifted Children, (Stanford, California: Stanford University Press, 1925).

Vol. II. The Early Mental Traits of Three Hundred Genuises, (Stanford, California: Stanford University Press, 1926).

Vol. III. The Promise of Youth, (Stanford, California: Stanford University Press, 1930).

Vol. IV. The Gifted Child Grows Up, (Stanford, California: Stanford University Press, 1947).

Vol. V. The Gifted Group at Mid-Life, (Stanford, California: Stanford University Press, 1959).

[3]Hollingworth, op. cit.

physical characteristics, traits of character, temperament, and interest, developmental rate, and family histories. Also, children who were considered exceptionally gifted (I.Q.'s 180 and above) were characterized primarily by individual case studies. Hollingworth's interest in the highly gifted led to her intensive study of this group and to the posthumous publication of her work entitled Children Above 180 I.Q.[1] In this volume she reviewed the literature dealing with the highly gifted and presented detailed case histories of twelve children whom she had known personally and had studied intensively. Although there are slight variations in the case histories due to the nature and availability of the data, each one typically dealt with family background, preschool and school history, teachers' rating, mental measurements and character traits, and physical measurements and health. Occasionally miscellaneous characteristics that could not be subsumed under other categories were included with records of siblings and later educational records. The approach used by Hollingworth is being adapted to some degree by Nicholas Hobbs in a comparative study of high and low achievers at the college level in a study currently in progress. Hobbs is giving more attention to socio-cultural factors in the family background of the subjects.[2]

One of the unique contributions of Hollingworth is the concept of "optimum intelligence." After reviewing the case histories of both the highly gifted (180 I.Q. and above) and comparing the problems of

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[1] Leta S. Hollingworth, Children Above 180 I.Q., (Yonkers-on-Hudson: World Book Co., 1942).

[2] Nicholas Hobbs, "Motivation to High Achievement," (Unpublished address presented in General Session Number 5 at the Council for Exceptional Children Conference, Kansas City, Missouri, 1958).

adjustment of this group with those children of superior intelligence, or with a moderate degree of giftedness, she concluded that the optimum range for good personal and social adjustment is from 130 to 150.[1] However, it should be noted that problems of adjustment of the highly gifted are probably more a function of the educational system than of the superior intelligence of the children. The highly gifted child is pursued by boredom and frustration in connection with both learning the social experiences. With the development of special programs for the gifted that avoid both lock-step age-grading system on the one hand, and the policy of accelerating the highly gifted child too rapidly on the other, society may yet learn how to permit the potentially creative genius a reasonably happy childhood.

More recent works by Paul Witty,[2] Gertrude Hildreth,[3] Theodore Hall,[4] DeHaan and Havighurst,[5] and numerous others have been predicated on the approach pioneered by Terman and his associates. The various programs of identification of the gifted by the use of intelligence tests and the several types of educational provisions are presented in considerable detail. However, until quite recently only a limited amount of research

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[1]Hollingworth, Children Above 180 I.Q., 265.

[2]American Association for Gifted Children, The Gifted Child, (Boston: D. C. Heath and Company, 1951).

[3]Gertrude Hildreth, et.al., Educating Gifted Children at Hunter College Elementary School, (New York: Harper and Brothers, 1952).

[4]Theodore Hall, Gifted Children: The Cleveland Story, (Cleveland: World Publishing Company, 1956).

[5]Robert F. DeHaan and Robert J. Havighurst, Educating Gifted Children, (Chicago: University of Chicago Press, 1957).

has been conducted at the college level except as parts of longitudinal studies of those who were identified earlier as gifted. Most of these studies have been primarily concerned with the academic performance and the personal and social adjustment at the college level of gifted persons who have been given some type of special program at the elementary and/or the secondary levels. The purposes of these studies have revolved primarily around determining the effects, if any, of specific programs on the performance and the adjustment of the gifted at the college level.

High-Achieving College Students

Within the last decade there have been several attempts to isolate the non-intellectual characteristics of college students that seem to be useful in the prediction of high-academic achievement. Two studies by McQuary[1] considered the differences between students adjudged "successful" and "unsuccessful" and under- and over-achievers on 23 variables including both intellectual and non-intellectual factors. The major non-intellectual variables were the occupational level of the father, the size of the home community, the educational level of the father, the degree of extra-curricular participation in high school, the number of siblings, and foreign-born parents. Few concrete conclusions were presented; however, it was found that the occupational and educational levels of the father and the

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[1]John P. McQuary, "Some Relationships Between Non-Intellectual Characteristics and Academic Achievement," Journal of Educational Psychology, XLIV, (1953), 215-28, and "Some Differences Between Under- and Over-Achievers in College," Educational Administration and Supervision, LX, (1954), 117-20.

degree of participation in high school extra-curricular activities were higher for the "successful" than for the "unsuccessful" student.

Georgiana Djen-dzi Wei Sie[1] attempted to determine the relationship between the Iowa Picture Interpretation Test, The Survey of Study Habits and Attitudes, and academic achievement. Four hundred undergraduate students who were enrolled in general psychology classes at the State University of Iowa were divided into two groups on the basis of achievement, and the responses of the groups on these two measures were compared. It was found that The Survey of Study Habits and Attitudes makes a significant contribution to the prediction of academic success, while the Iowa Picture Interpretation Test seems to have no relationship to achievement.

Lewis William Field[2] made a study which was concerned with identifying the personality correlates of college achievement and major areas of study. He divided 125 male college students into sub-groups of 29 and in terms of class standing and major fields (physical science or social science). He measured five source traits (Social Adaptability; Emotional Control; Conformity; Inquiring Intellect; and Confident Self-Expression), attitude as measured by the F-Scale, and perception by the judging of sizes of squares. Field also administered modified forms of the Strong VIB and the Blacky Pictures. He found that high achievers were significantly higher on Conformity, Inquiring Intellect and Confident Self-Expression. They

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[1]Georgiana Djen-Dzi Wei Sie, "The Relationship of Two Experimental Measures of Student Motivation to Academic Success in College," Dissertation Abstracts, XV, (1955), 1556-7.

[2]Lewis William Field, "Personality Correlates of College Achievement and Major Areas of Study," Dissertation Abstracts, XIV, (1954), 13344-5.

were reliably higher, also on the F-Scale (more liberal) and on a preceived similarity score. There were no significant differences between the high and low achievers on Social Adaptability, Emotional Control, the perceptual scores, or on the Blacky Pictures. A few other differences between social science and physical science majors were noted but they are not relevant to this study.

William Levi Cash used data from the Bernreuter Personality Test, the Ohio State Psychological Examination, the socio-economic background of the student, and other sources, in a comparison of Protestant Seminarians of two levels of academic achievement.[1] Some relationship was found between the characteristic of self-sufficiency, length of attendance in the Seminary, and grade-point ratio in New Testament courses. No relationship was found between scholastic aptitude as measured by the Ohio State Psychological Examination and grade-point ratios on theoretical courses.

Vivian Humphrey Hewer, in a study of the interests, ability, and achievement of 296 pre-medical students at the University of Minnesota, found no evidence that the physician's scale of the Strong VIB was useful in the prediction of the level of performance of under-graduate pre-medical students when the factor of ability was controlled.[2] On the other hand, Collins reported that there is "a low but significant correlation (.20)

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[1]William Levi Cash, "The Relation of Personality Traits to Scholastic Aptitude and Academic Achievement of Students in a Liberal Protestant Seminary," Dissertation Abstracts, XIV, (1954), 630-1.

[2]Vivian Humphrey Hewer, "Vocational Interest-Achievement-Ability: Interrelationships at the College Level," Dissertation Abstracts, XIV, (1954), 1257-8.

of breadth of academic interest with achievement, but a correlation approaching zero with academic aptitude."[1] Breadth of academic interest was measured by the number of "Likes" marked on the Interest Index and School Subjects on the Strong VIB. However, Ryan attempted to determine the differences between two groups of Yale College Freshmen adjudged as under- and over-achievers using the Group Rorschach Test, the Strong VIB, and a short questionnaire concerning parental occupation, socio-economic background, and other personal data.[2] He found that the over-achievers scored a significantly higher number of popular responses on the Rorschach Group Test. The under-achievers scored higher than chance expectancy on the Masculinity-Femininity Scale and lower on the Minister's scale of the Strong VIB. Ryan concluded, however, that "the Strong Vocational Interest Blank is not an entirely adequate instrument for the investigation of discrepancies in college achievement."[3]

Thompson selected 113 first-year students in a Lutheran Seminary as subjects in a study of the relationship of variables measured by the Minnesota Multiphasic Personality Inventory (hereafter called MMPI) and the Strong VIB to the first year Seminary work.[4] His most significant

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[1]Charles Cornelius Collins, "The Relationship of Breadth of Academic Achievement and Academic Aptitude," Dissertation Abstracts, XV, (1955), 1728.

[2]Francis Joseph Ryan, "Personality Differences Between Under- and Over-Achievers in College," Microfilm Abstracts, XI, (1951), 567-8.

[3]Ibid., 568.

[4]Sogn Jargen Thompson, "A Study of the Relationships Between Certain Measured Psychological Variables and Achievement in the First Year of Seminary Work," Dissertation Abstracts, XVI, (1956), 1846-7.

finding was a positive significant relationship at the .01 level between the Minister's scale of the Strong VIB and teachers' ratings. He concluded that both the Strong VIB and MMPI are appropriate measures for seminary students.

Bergeron considered several factors and their relationship to academic success of freshman students at the University of Arkansas. Among the non-intellectual factors were age of admission, sex, occupation of parents, state of residence, and various aspects of the secondary school which the student attended. He reported no significant differences in any of the non-intellectual factors.[1]

Another study of college freshmen was conducted by Wellington at a Mid-western liberal arts college. He isolated the fifteen most successful, twenty-two unsuccessful, and thirty-four most unsuccessful out of eighty-seven resident freshmen to measure for "non-intellectual" factors. Wellington used the Mooney Problem Check List and personal interviews. He found that high achievers, or "most successful students," were highly cooperative and sociable in comparison to the most unsuccessful students. He concluded that intellectual factors, if measured by the Primary Mental Abilities Test are better predictors of academic success than the non-intellectual characteristics measured.[2]

Cooper attempted to determine differences in the personal and social

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[1]Wilbur Lee Bergeron, "An Analysis of the Relationship Between Selected Characteristics and Academic Success of Freshmen at the University of Arkansas," Dissertation Abstracts, XIII, (1953), 505.

[2]John Adam Wellington, "Factors Related to the Academic Success of Resident Freshmen at Mid-Western Liberal Arts College During the Academic Year 1952-53," Dissertation Abstracts, XVI, (1954), 69.

adjustment of successful and unsuccessful college students by the use of the MMPI, the Guilford-Martin Factors GAMIN, An Inventory of Factors STDCR, the Guilford-Martin Personality Inventory, the Kuder Preference Record, Form G, and several others. His general conclusions were that the unsuccessful student was more careless, less self-critical, and less able to comprehend instructions and test items. However, he found that there was no difference in the tendency to be depressed, or to feel useless and unworthy. The unsuccessful girls tended to deviate toward interests of the opposite sex.[1]

The way in which a student views the college situation and himself in relation to college was examined by Kerns as a possible factor in academic achievement. He selected sixty-six under-achievers, and sixty-six over-achievers from two hundred sixty-five freshmen whose scores deviated most from the predicted grade point average based upon the ACE Psychological Examination. He found that the under-achievers tended to enter college because of parental pressure, to get out of the draft, or for some other negative reason. Little or no intrinsic motivation was found. The under-achievers derived most of their satisfaction from social activities, athletic events and other non-academic activities. They were most annoyed by assignments and college regulations. Almost the exact opposite was true of the over-achievers. They derived most of their satisfaction from doing good class work, pursuing areas of special interest in addition to regular assignments, and as a group, they were

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[1]Matthew Nathaniel Cooper, "To Determine the Nature and Significance, If Any, of Certain Differences in the Social and Personal Adjustment of Fifty-one Successful and Fifty-one Non-Successful College Students at Texas Southern University," Dissertation Abstracts, XVI, (1956), 497.

most annoyed by interference with study and by other students who tried to cheat their way through college work.[1]

Another study which sought to determine factors other than scholastic achievement and aptitude related to over- and under-achievement at the college level was conducted by Boyce. His study consisted of two groups of forty-nine students each compared on the basis of thirty-eight items pertaining to interests, personality characteristics, home and parental background, activities participation, health, reading skill, and vocational plans. The non-intellectual characteristics were identified by a brief questionnaire, the Strong VIB, and the MMPI. The two groups were significantly different at the .05 level of confidence or less on eleven of the thirty-eight variables when the median test and the chi square technique were applied. A significantly greater number of over-achievers than under-achievers had one or both parents foreign born, were non-residents of Wisconsin, lived in private residences at the University, felt that their study habits were efficient or average, felt that their reading skills were a handicap, had lived in large cities most of their lives, devoted more hours to study each week, and had more deviate depression scores on the MMPI. Under-achievers, on the other hand had a significantly greater number whose fathers were in the professional class and were better educated, and deviated to a greater degree on the hypomania MMPI score.[2]

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[1]Byron Lyle Kerns, "A Study of Under-Achieving and Over-Achieving First-Semester College Freshmen as Revealed by the Way in Which They View the College Situation and Themselves as College Students." Dissertation Abstracts, XVII, (1957), 2500.

[2]Ernest Marshall Boyce, "A Comparative Study of Over-Achieving and Under-Achieving College Students on Factors Other Than Scholastic Aptitude." Dissertation Abstracts, XVI, (1956), 2088.

The freshmen women of Northwestern University in the fall of 1954, were studied by Nancy Katherine Knook on the non-intellectual factors measured by the Guilford-Zimmerman Temperament Survey. Thirty-five honor students with averages of "A-" or above, and fifty-four probation students with averages below "C" were compared. Probation students were significantly higher on sociability, and significantly lower on seriousness and reflectiveness.[1]

Quinn attempted to construct empirically a personality scale on the MMPI which would be relatively independent of academic aptitude and positively related to college achievement. He concluded that when intelligence was properly controlled the MMPI standard scales failed to define the differential personality characteristics of over- and under-achievers at the college level.[2]

Summary

The subjects of early studies of persons of "genius" by Galton and Lombroso, and of outstanding persons in the several disciplines by Cattell, were selected on the basis of actual performance in their chosen professions. The measurement movement after World War I and the translations of the Binet-Simon Scales into English contributed to a new approach. Persons were identified during early and middle childhood as "gifted" on

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[1]Nancy Katherine Knook, "A Study of the Characteristics of Academically Successful and Unsuccessful Freshmen Women Who Entered Northwestern University in the Fall of 1954," Dissertation Abstracts XVIII, (1958), 304.

[2]Stanley Brittain Quinn, "Relationships of Certain Personality Characteristics to College Achievement," Dissertation Abstracts, XVIII, (1958), 809.

the basis of Binet I.Q.s above 135 to 140. Early identification of persons with high mental ability made possible longitudinal studies and opened the door to new programs of education for the rapid learner.

In recent years interest has grown in the high-achieving college student who may or may not have been identified as "gifted" in the public schools. The perennial problem of educators is the gap that often appears between academic achievement and academic aptitude. Studies reported to the present time present inconclusive and often conflicting results. Non-intellectual personality characteristics concomitant with high achievement are highly elusive. While socio-economic status and the professional and educational levels of fathers ordinarily correlate positively with academic achievement of students, Boyce found these characteristics more frequently among "under-achievers."[1] Other studies reviewed in this chapter tend to picture the high-achieving student as more cooperative, more self-critical, less concerned about extra-curricular activities and more efficient in study habits and reading skills. Often when the factor of academic aptitude has been controlled there have been found no significant differences in the personality characteristics of the high achievers and the control groups utilized.

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[1] Boyce, op. cit.

CHAPTER III

INTER-GROUP AND INTRA-GROUP COMPARISONS OF NON-INTELLECTUAL PERSONALITY TRAITS OF HIGH- AND MODERATE-ACADEMIC ACHIEVERS

The two groups of students described as high- and moderate-academic achievers are compared on each of twenty-five non-intellectual personality traits. The procedure outlined in Chapter I is followed in testing the null hypothesis relative to each group or sub-group on the several traits. Several tables are presented in the appendix in order to avoid repetitious statements concerning chi squares and the frequencies of scores above and below the combined medians for each set of comparisons made on each variable. A composite table in which the chi squares and probabilities that may be regarded as significant or indicative of a trend is presented as a basis for discussion.

The Edwards PPS

The comparisons made between the several groups and sub-groups on the variables measured by the Edwards PPS reveal few differences with probabilities of less than .05. There are, however, several differences, which approach significance when seen in context (Table 3).

Achievement

On the achievement variable the only difference found that approaches the .05 level is between the high- and moderate-achieving male students

(chi square = 3.61 /3.84-P.05). There are no differences between the various sub-groups paired for comparison. High-achieving male students as a group tend to "need" to put forth their best efforts and to accomplish something of great significance. However, the achievement scale does not differentiate as sharply as it might between persons of the two levels of achievement.

Deference

The Deference scale, which attempts to identify persons with the need to conform to customs and with the related need to demonstrate and to expect the accepted social amenities and to follow the instructions and leadership of others, fails to discriminate between the total groups (I and II), but it does reveal differences between some of the sub-groups. High-achieving moderate-ability students (IB) have significantly greater "deference needs" (P's/.05) than do either of the moderate-achieving sub-groups (IIA or IIB). These students who may be characterized as "over-achievers" are more apt to be social conformists than either the moderate-achieving high-ability (under-achievers) or the moderate-achieving moderate-ability students. The differences noted between Groups I and II (combined) and I and II (Female) (P's/.30) may be indicative of a slight tendency for the high achievers as a group to have a higher deference need. However this tendency seems to be attributable largely to the influence of moderate-ability students with high academic records.

TABLE 3

SUMMARY OF CHI SQUARES ABOVE ONE AND PROBABILITIES OF DIFFERENCES DUE TO CHANCE BETWEEN GROUPS AND SUB-GROUPS FOR THE VARIABLES MEASURED BY THE EDWARDS PPS

Variable	Groups and Sub-Groups	Chi Square	Probability	Higher Group
Achievement	I and II (Male)	3.61	/.10	I (Male)
	I and II (Combined)	1.79	/.30	I (Combined)
Deference	I and II (Female)	1.43	/.30	I (Female)
	I and II (Combined)	1.31	/.30	I (Combined)
	IB and IIB	4.89	/.05	IB
	IB and IIA	4.89	/.05	IB
Autonomy	IA and IB	2.13	/.20	IB
	IA and IIA	2.13	/.20	IIA
	IB and IIB	2.13	/.20	IB
	IIA and IIB	2.13	/.20	IIA
	IB and IIA	2.13	/.20	IB
	IA and IIB	1.10	/.30	IIB
Intraception	IIA and IIB	1.25	/.30	IIB
Dominance	IA and IB	13.33	/.001	IA
	IA and IIA	6.56	/.02	IA
	IB and IIB	5.17	/.05	IIB
	IIA and IIB	3.47	/.10	IIB
Abasement	IA and IB	1.20	/.30	IB

TABLE 3 Continued

Nurturance	IA and IB	2.17	$<.20$	IB
	IA and IIB	1.39	$<.20$	IIB
Change	I and II (Female)	4.63	$<.05$	II
	I and II (Total)	2.89	$<.10$	II
	IA and IIA	1.25	$<.30$	IIA
	IIA and IIB	1.25	$<.30$	IIA
	IB and IIA	1.25	$<.30$	IIA
Endurance	IIA and IIB	2.30	$<.20$	II
Hetero-sexuality	I and II (Male)	1.60	$<.30$	II
	I and II (Total)	1.31	$<.30$	II
	IA and IIA	2.13	$<.20$	IIA
	IIA and IIB	6.56	$<.02$	IIA
	IB and IIA	4.80	$<.05$	IIA

Autonomy

The Autonomy scale fails to reveal any differences with a probability of less than .20 between either the main groups or the sub-groups. However, an interesting pattern of differences all of which are significant at the .20 level of confidence may be noted. Sub-group IB, the high-achieving moderate-ability students, or the "over-achievers," have a slightly higher proportion of scores above the median when compared with each of the other three sub-groups. While these results are far from conclusive, they do suggest that there is a tendency for students who use more effectively their academic abilities to have a greater need for autonomy

than do either those students who achieve as expected or those who achieve below expectation (under-achievers).

Dominance

The Dominance scale, which is designed to isolate those persons who tend to assume the leadership role in discussion and activity groups, and who seem to need to over-ride arguments of others and to direct their activities, reveals some interesting differences between students of the several sub-groups. In general, students who achieve at the expected levels tend to have a greater need to dominate others than do either those who achieve above or below expectations. This is not revealed in comparisons of the total groups, but when sub-groups are compared holding the factor of ability constant at the upper and lower levels this difference is observable. Two comparisons with probabilities of .001 and .02 show high-achieving high-ability students (IA) more dominant than either high-achieving moderate-ability (IB), or moderate-achieving high-ability students (IIA). Moderate-achieving students with moderate ability (IIB) show higher dominance needs than do either high-achieving moderate-ability or moderate-achieving high-ability students (IB and IIA).

Nurturance

The variable which is generally suggestive of helpfulness and the sympathetic understanding of others, nurturance, is apparently no more descriptive of one group, or sub-group than another. The high-achieving high-ability students (IA) show a slightly lower nurturance need than do either of the moderate ability sub-groups (IA and IB -P= .20; IA and IIB -P= .20). These isolated differences are not statistically significant.

Change

The tendency toward searching for novelty and escape from routine activities as measured by the Change scale appears to be more common among moderate achievers regardless of the level of ability. Only one set of comparisons reveals a difference with a probability of less than .05 (I and II Female), and the total groups (I and II) have a difference that is significant at the .10 level. High-ability moderate-achieving students (IIA) show a slight but more persistent tendency (P's$<$.30) toward change than do the other three sub-groups with which they are compared. This may be suggestive of a tendency toward escaping from the difficult situation instead of working through it. However, these results are only suggestive and cannot be considered conclusive.

Endurance

The scale which seems to measure the antithesis of the variable just discussed, endurance, and the one which might have been expected to reveal highly significant differences, failed to do so. Only one set of comparisons (IIA and IIB) revealed a chi square greater than one (chi square = 2.30, P$<$.20). The moderate-ability moderate-achieving students had a higher number of scores above the combined median than did the moderate-achieving high-ability students. However, this result is isolated and falls below the required level of significance.

Heterosexuality

This scale which is designed to measure the general attitude toward, and relationship with, members of the opposite sex, reveals an interesting

pattern although only two comparisons show a difference below the .05 level (IIA and IIB - chi square = 6.56, P/.02, and IB and IIA - chi square = 4.80, P/.05). These rather significant differences between moderate-achieving high-ability, moderate-ability moderate-achieving, and moderate-ability high-achieving students seem to indicate that interests in the opposite sex and in social activities may supersede interests in academic work among the students with high abilities and only average grades. It should be noted that moderate-achieving students, regardless of the level of ability, have a slightly greater tendency to value heterosexual activities more highly than do the high-achieving students.

Intraception and Abasement

The Intraception scale which is designed to measure the tendency toward self-analysis and the analysis and understanding of others, and the Abasement scale, which attempts to measure the tendency toward guilt feelings and submission to the demands of others, fail to distinguish between either the major groups or any of the sub-groups. Only one chi square above one is found for the data from each of these scales (1.25 - P/.30; 1.20 - P/.30), and neither approaches the required level of significance.

The remaining scales of the Edwards PPS, Order, Exhibition, Affiliation, Succorance, and Aggression reveal no differences on any of the comparisons above the approximate chance level.

The AVL Study of Values

When Spranger[1] developed and defended the thesis that the most

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[1] E. Spranger, Types of Men, (Translated from 5th German edition of Lebensformen by Paul J. W. Pigors. Halle: Max Miemeyer Verlag. American agent: Stechert-Hafner, Inc., 31 East 10th Street, New York 3, N. Y.).

appropriate way to characterize the human personality is through the individual value systems, or the bodies of evaluative attitudes, the foundation of a new approach to the study of personality was laid. It was necessary, however, that an acceptable device for the measurement of value systems be constructed and validated. An effort to produce such a device was made by Gordon W. Allport and Philip E. Vernon in 1931. After twenty years of research in which item analysis and other techniques for the selection of items with greater diagnostic power were utilized, and in which vague and obscure terms were isolated, the Revised Edition of the Study of Values was published in 1951, under the joint authorship of Gordon W. Allport, Philip E. Vernon, and Gardner Lindzey.

It has been demonstrated fairly conclusively that the Study of Values Revised Edition, does discriminate between the various occupational groups.[1] In this study an effort is being made to determine the differences between two groups of different levels of academic achievement but with similar intellectual abilities. The following discussion is based on data summarized in Table 4.

Theoretical

The search for truth for its own sake with little concern for its utility is characteristic of the individual with a high theoretical interest. Comparisons of the total groups and the various sub-groups fail to reveal any differences. On this particular sample of college students, the theoretical scale fails to distinguish between high- and

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[1] Gordon W. Allport, Philip E. Vernon, and Gardner Lindzey, Study of Values: Manual of Directions, Rev. ed., (Boston: Houghton Mifflin Co., 1951).

TABLE 4

SUMMARY OF CHI SQUARES ABOVE ONE AND PROBABILITIES OF DIFFERENCES DUE TO CHANCE BETWEEN GROUPS AND SUB-GROUPS FOR THE VARIABLES MEASURED BY THE AVL STUDY OF VALUES

Variable	Groups and Sub-Groups	Chi Square	Probability	Higher Group
Theoretical	(No chi squares above 1)			
Economic	I and II (Female)	1.43	$<.30$	II
	IB and IIB	1.25	$<.30$	IIB
	IIA and IIB	2.13	$<.20$	IIB
	IA and IIB	2.17	$<.20$	IIB
Aesthetic	IA and IIA	2.13	$<.20$	IIA
	IB and IIB	1.21	$<.30$	IB
	IIA and IIB	3.35	$<.10$	IIA
	IB and IIA	2.13	$<.20$	IIA
	IA and IIB	2.13	$<.20$	IA
Social	IIA and IIB	1.21	$<.30$	IIB
	IA and IIB	1.20	$<.30$	IIB
Political	I and II (Female)	2.99	$<.10$	I
	IA and IB	2.17	$<.20$	IB
Religious	IA and IIA	3.35	$<.10$	IA
	IIA and IIB	3.35	$<.10$	IIB

moderate-achievers at either level of ability; nor are any differences noted when the factor of sex is held constant.

Economic

An interest in and a relatively high evaluation of the utilitarian is the basic characteristic of the person who scores significantly above the average on the economic scale. There are no differences between the groups or sub-groups in this study with a probability of less than .20. However, it may be significant that the moderate-achieving moderate-ability students show a slightly higher proportion of scores above the median when paried with each of the other three sub-groups (chi squares = 1.25, P/.30; 2.13, P/.20 and 2.17, P/.20). Also, moderate-achieving female students show a slightly higher economic interest than do high-achieving female students.

Aesthetic

The love of beauty, harmony, and symmetry as measured by the aesthetic scale seems to be more closely related to academic ability than to academic achievement. While no differences with probabilities of less than .10 are found, the high-ability sub-groups consistently show slightly stronger tendencies toward the aesthetic. When the factor of ability is held constant the moderate-achieving high-ability student shows a slightly higher aesthetic interest than does the high-ability high-achieving student (IIA and IA). On the other hand, a comparison of the two moderate-ability sub-groups (IB and IIB) reveals that the high-achiever has a slightly higher aesthetic interest. These differences are only slight, however, and the results cannot be interpreted as conclusive.

Social

The love of people and a general orientation toward social service

as measured by this scale seem to be no more characteristic of one group or sub-group of subjects than another. Only two chi squares above one are shown, and these (1.21, P/.30 and 1.20, P/.30) fail to reach a desired level of significance.

Political

The interest, or value, factor ostensibly measured by this scale is characteristic of leaders who seek power. It is not limited to governmental activities but may be found in almost any profession or vocation in which one person may develop and exercise leadership. Among the subjects studied, only two groups showed differences with probabilities of less than .30 and no generalizations can be made from them. High-achieving female students show a slight tendency to value power and leadership more than do moderate-achieving females (chi square = 2.91, P/.10). Also, high-achieving moderate-ability students (IB) may tend to show a slightly higher interest in power and leadership than do high-ability high-achieving students (IA).

Religious

The relationship of the individual to Ultimate Reality and his attitude toward organized religion are measured by this scale. High-achieving female students show a slightly higher religious interest than do moderate-achieving female students (chi square = 3.35, P/.10), and moderate-achieving moderate-ability students (IIB) show the same degree of preference over the moderate-achieving high-ability students (IA). These isolated differences fail to reveal tendencies of significance.

The Strong VIB

The four scales of the Strong VIB used in this study seem to distinguish more consistently between the two groups and the several sub-groups studied than do any of the scales of the Edwards PPS or the AVL Study of Values. The results are summarized in Table 5.

Occupational Level

The Occupational Level scale is designed to distinguish between the interests of persons at the various levels of occupations from the unskilled to the managerial and the professional groups. Strong has demonstrated that a rank order of occupations in terms of interests can be established.[1]

One of the more significant findings of this study is that high-achieving students score consistently higher on the Occupational Level scale than do moderate-achieving students. When the high- and the moderate-achieving groups (Groups I and II, combined) are compared, the differences produce a chi square of 5.23 which is significant at the .05 level of confidence. These differences hold when the factor of sex is controlled. High-achieving male students score higher on the Occupational Level scale (chi square = 4.90, $P < .05$) than do moderate-achieving male students, and high-achieving female students score higher (chi square = 3.66, $P < .10$) than do their moderate-achieving counterparts. When achievement is held constant and the high-achieving high-ability students are compared with high-achieving moderate-ability students (Sub-groups IA and IB),

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[1] Edward K. Strong, Jr., Vocational Interests of Men and Women, (Stanford, California: Stanford University Press, 1943), 185-215.

high-ability students tend to score slightly higher (chi square = 2.13, P/.20). The opposite seems to be true when the moderate-achieving subgroups (IIA and IIB) are compared. However this difference may be due to chance factors since it has a probability of /.30. Another interesting, although not statistically significant, difference is found between over-achievers and under-achievers (IB and IIA). Students who achieve above expectations score slightly higher on the Occupational Level scale than do students whose achievement is lower than might be expected (chi square = 3.35, P/.10).

Specialization Level

The Specialization Level scale is in some respects a refinement of the Occupational Level scale, although it does tend to cut across several of the Occupational Levels and to reveal interests in specialized functions at the various levels.

Two of the more significant findings of this study indicate that interest in higher levels of specialization tends to be more a function of high ability than of high achievement. With achievement held constant at the upper level (IA and IB), the high-ability students have higher scores on this scale than do moderate-ability students (chi square = 8.55, P/.01). Also when over-achievers and under-achievers are compared, (IB and IIA) it is the under-achieving group that has the higher proportion of scores above the combined median (chi square = 8.57, P/.01). Again, when achievement is held constant at the lower level (IIA and IIB), the high-ability students show a greater interest in higher levels of specialization (chi square = 4.80, P/.05). With the factors of achievement and

TABLE 5

SUMMARY OF CHI SQUARES ABOVE ONE AND PROBABILITIES OF DIFFERENCES DUE TO CHANCE BETWEEN GROUPS AND SUB-GROUPS FOR THE VARIABLES MEASURED BY THE STRONG VIB

Variable	Groups and Sub-Groups	Chi Squares	Probability	Higher Group
Occupational Level	I and II (Male)	4.90	$<.05$	I
	I and II (Female)	3.66	$<.10$	I
	I and II (Total)	5.23	$<.05$	I
	IA and IB	2.13	$<.20$	IA
	IA and IIA	2.13	$<.20$	IA
	IIA and IIB	1.25	$<.30$	IIB
	IB and IIA	3.35	$<.10$	IB
Specialization Level	I and II (Female)	2.06	$<.20$	I
	IA and IB	8.55	$<.01$	IA
	IIA and IIB	4.80	$<.05$	IIA
	IB and IIA	8.57	$<.01$	IIA
	IA and IIB	2.13	$<.20$	IA
Masculinity-Femininity	IA and IB	2.13	$<.20$	IB
	IIA and IIB	2.13	$<.20$	IIB
	IB and IIA	2.13	$<.20$	IB
	IA and IIB	2.13	$<.20$	IA
Interest Maturity	I and II (Female)	8.23	$<.01$	I
	I and II (Total)	1.78	$<.20$	I
	IA and IB	2.13	$<.20$	IA
	IA and IIA	2.13	$<.20$	IA
	IIA and IIB	2.13	$<.20$	IIA
	IA and IIB	4.82	$<.05$	IA

ability combined (IA and IIB) a slight difference in favor of the high-achieving high-ability student is found (chi square = 2.13, P$<$.20).

Masculinity-Femininity

This scale is designed to show the differences in the interest patterns of males and females. Obviously the cultural stereotype of the two sexes must be considered in the interpretation of the data. Many interests ordinarily considered "feminine" may be found in men who prefer music, art, and literature to the more frequently recognized "masculine" interests as athletic events and outdoor activities. The Masculinity-Femininity scale fails to distinguish between any of the major groups or sub-groups with a probability less than .20. Three of the four differences found suggest that there may be an inverse relationship between scores on this scale and academic ability, but no observable relationship between the Masculinity-Femininity scores and academic achievement is found. When achievement is held constant at the higher level (IA and IB) there is a tendency for the moderate-ability student to score higher than the high-ability student (chi square = 2.13, P/.20). This same tendency is seen when achievement is held constant at the lower level (IIA and IIB). On the other hand, when academic ability is held constant no differences are found. In a comparison of under-achievers and over-achievers (IB and IIA), the high-achieving moderate-ability students tend to score slightly higher (chi square = 2.13, P/.20). There seems to be a reversal of this trend when academic achievement and ability are combined (IA and IIB). High-ability high-achieving students tend to score slightly higher than do moderate-achieving moderate-ability students. Since none of the differences revealed by this scale is significant above the .20 level of confidence, this apparent discrepancy might be due to chance factors.

Summary

Several interesting trends that are suggestive, although not always statistically significant, may be noted. High-achieving students score fairly consistently, although not always significantly, higher on the Deference scale of the Edwards PPS. High-ability does not seem to contribute to this trend. Moderate-ability high-achievers (over-achievers) are significantly higher when compared with moderate-achievers with either high- or moderate-ability. This scale might prove useful in the identification of over-achievers. Also over-achievers generally tend to score higher in the Autonomy scale.

The relationship of the tendency toward dominance to achievement at the expected level is indicated by the fact that high-achieving students with high-ability, and moderate-achieving students with moderate-ability score higher than do either under-achievers or over-achievers with which they are compared. A low dominance score seems to be characteristic of the over-achiever.

The Change and the Heterosexuality scales seem to have definite possibilities for the identification of under-achievers. Moderate-achievers score consistently higher on these scales with high-ability students contributing more heavily to the trend.

It is questionable whether the AVL Study of Values can be used effectively to identify students of different levels of achievement without regard for vocational preferences. Higher scores on the Economic scale seem to be somewhat characteristic of moderate-ability moderate-achievers. On the other hand, higher scores on the Aesthetic scale seem to be

characteristic of under-achievers. However, since no statistically significant differences are found it is likely that this measure is not sufficiently refined to be of value in this context.

The Occupational Level and the Interest Maturity scales of the Strong VIB seem to have definite possibilities for identifying high-academic achievers. In every comparison in which a high-achieving group, or sub-group, is matched with a moderate-achieving group, or sub-group, the high-achieving subjects tend to score higher on these two scales.

The Specialization Level scale seems to have no relationship to academic achievement, but it is definitely related to academic ability. In every case in which high- and moderate-ability subjects are compared, high-ability students have the greater proportion of the scores above the median. This scale seems to be of no value in the identification of high-achievers when the factor of ability is held constant.

CHAPTER IV

SUMMARY AND RECOMMENDATION

Summary of Procedure

The importance of high-academic achievement among high school and college students has been dramatized in recent years. This study is undertaken in an effort to determine the non-intellectual personality traits concomitant with high achievement for the purpose of providing more effective guidance for students in the more efficient use of their academic abilities. Fifty-five students who achieved a quality-point average of 3.5, or above, on a possible 4.0 scale during the first semester of the schcol year 1958-1959, in the College of Liberal Arts of Oklahoma Baptist University, were matched for academic classification, sex, and intelligence, or academic ability, as measured by the ACE Psychological Examination, with fifty-five students who achieved an academic average of between 2.0 and 2.5 on the same scale. The Edwards PPS, the AVL Study of Values and the Strong VIB were administered to the subjects in April, 1959.

Four sub-groups consisting of the upper and lower 27 percents of each of the major groups as measured by the ACE Psychological Examination are isolated for the purpose of determining differences between students who achieve at the same level but who differ significantly in academic ability, as well as differences between students who are matched at the upper and the lower levels for academic ability, but whose achievement

differs significantly. Comparisons are made between students who achieve as expected according to their abilities and those who achieve both above and below the expected levels.

Summary of Findings

1. The hypothesis that there will be no difference between the high-academic achiever and the moderate-academic achiever on the variables measured by the Edwards PPS is accepted.

2. The hypothesis that there will be no difference between high-academic achievers and moderate-academic achievers on the variables measured by the AVL Study of Values is accepted.

3. The hypothesis that there will be no difference between the high-academic achiever and the moderate-academic achiever on the variables measured by the Strong VIB is rejected at the .05 level of confidence for the Occupational Level variable and accepted for the other variables. High-achieving students as a group have interests more similar to those of managerial and professional persons than do moderate-achieving students.

4. The hypothesis that there will be no difference between high-achieving male students is rejected at the .05 level of confidence for the Occupational Level variable of the Strong VIB. High-achieving male students have interests more similar to those of managerial and professional persons than do moderate-achieving male students. The hypothesis that there is no difference between these two groups of male students is accepted for the other variables.

5. The hypothesis that there will be no difference between high-achieving female students and moderate-achieving female students is

rejected at the .05 level of confidence for the Change variable of the Edwards PPS, and at the .01 level of confidence for the Interest Maturity variable of the Strong VIB. It is accepted for the other variables. High-achieving female students have less need for change, less tendency to escape from difficult situations by seeking new surroundings and new activities. Also, their interests are more stable and more mature.

6a. The hypothesis that there will be no difference between high-ability high-achieving students (Sub-group IA) and high-achieving moderate-ability students (Sub-group IB) is rejected at the .001 level of confidence for the Dominance variable of the Edwards PPS and accepted for the other variables. High-achieving high-ability students have higher dominance needs than do high-achieving moderate-ability students.

6b. The hypothesis that there will be no difference between moderate-achieving high-ability students (Sub-group IIA) and moderate-achieving moderate-ability students (Sub-group IIB) is rejected at the .02 level of confidence for the Heterosexuality variable measured by the Edwards PPS and at the .05 level of confidence for the Specialization Level variable measured by the Strong VIB. It is accepted for the other variables. High-ability moderate-achieving students show more interest both in heterosexual relationships and in higher levels of specialization than do moderate-ability moderate-achieving students.

6c. The hypothesis that there will be no difference between high-achieving high-ability students (Sub-group IA) and moderate-achieving high-ability students (Sub-Group IIA) is rejected at the .02 level of confidence for the Dominance variable measured by the Edwards PPS and accepted for the other variables. High-ability high-achieving students show higher

dominance needs than do students with high-ability and moderate-achievement records.

6d. The hypothesis that there will be no difference between high-achieving moderate-ability students (Sub-group IB) and moderate-achieving moderate-ability students (Sub-group IIB) is rejected at the .05 level of confidence for both the Deference and the Dominance variables measured by the Edwards PPS and accepted for the other variables. High-achieving moderate-ability students have higher Deference needs and lower Dominance needs than do moderate-achieving moderate-ability students.

6e. The hypothesis that there is no difference between high-achieving moderate-ability students (Sub-group IB) and moderate-achieving high-ability students (Sub-group IIA) is rejected at the .05 level of confidence for the Deference and the Heterosexuality variables measured by the Edwards PPS and at the .01 level of confidence for the Specialization Level variable measured by the Strong VIB. It is accepted for the other variables. High-achieving moderate-ability students have higher Deference needs and lower interests in heterosexual relationships. They also have less interest in higher levels of specialization than do moderate-achieving high-ability students.

6f. The hypothesis that there will be no difference between high-achieving high-ability students (Sub-group IA) and moderate-achieving moderate-ability students (Sub-group IIB) is rejected at the .05 level of confidence for the Interest Maturity variable measured by the Strong VIB and accepted for the other variables. High-ability high-achieving students have more stable and more mature interests than do moderate-achieving moderate-ability students.

Conclusions

In light of the above findings it seems unlikely that high-achievers at the college level can be characterized as a group with the measures used in this study. The two groups matched for sex, academic classification, and mental ability are significantly different at the .05 level of confidence on only one (Occupational Level) of the twenty-five variables measured. A significantly greater number of the high-achievers show interests in the higher managerial and professional level occupations.

When the factor of sex is controlled, two additional differences with probabilities of .05, or less, are found. High-achieving male students show a greater interest in the higher level occupations, and high-achieving female students have more mature and more stable interests than do their moderate-achieving counterparts.

Several more differences with probabilities of .05, or less, are found when the factor of ability is held constant at the upper and lower levels. This suggests that there may be more differences in the non-intellectual personality characteristics of students who achieve at the same level, although they differ significantly in academic ability, than there are between students who are matched for academic ability but who achieve at different levels.

Recommendations

Although the findings of this study raise serious questions as to the value of the measures used for the identification, or the characterization of the high, or potentially high, academic achiever, it was

suggested in the conclusion of Chapter III that some of the scales of the Edwards PPS and the Strong VIB seem to have possibilities. It has been demonstrated that these measures do not differentiate between the two groups each of which contains subjects of both sexes with such a wide range of academic ability. A larger number of subjects selected from several church-related liberal arts colleges and divided into sub-groups that are relatively homogeneous in academic ability would probably yield significant differences on some of the variables measured. This is particularly true of the Deference, Autonomy, Change, and Heterosexuality scales of the Edwards PPS and the Occupational Level and Interest Maturity scales of the Strong VIB. By reducing the number of variables studied, the researcher can increase the number of subjects considerably and can give more attention to those variables that seem to be related to the different levels of academic achievement.

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APPENDIX I

GROUP I - HIGH-ACADEMIC ACHIEVERS

GROUP II - MODERATE-ACADEMIC ACHIEVERS

ACE PSYCHOLOGICAL EXAMINATION

GROSS SCORES

ACCORDING TO SEX AND ACADEMIC CLASSIFICATION

TABLE 6

MATCHED GROUPS: GROUP I - HIGH-ACADEMIC ACHIEVERS
GROUP II - MODERATE-ACADEMIC ACHIEVERS

ACE Psychological Examination Scores

Group I	Group II	Group I	Group II
Senior Men		**Sophomore Men**	
155	146	157	153
131	130	135	136
130	129	133	135
120	120	110	110
114	114		
113	111	**Sophomore Women**	
107	107		
104	104	157	161
		140	142
Senior Women		128	129
		128	127
135	139	123	125
131	138	114	113
129	135	108	108
124	131	101	102
97	99		
		Freshman Men	
Junior Men			
		145	146
146	146	119	119
125	124	109	109
120	120		
110	110	**Freshman Women**	
106	107		
		152	155
Junior Women		148	144
		138	136
150	144	133	135
148	127	129	128
144	122	127	127
132	120	121	122
124	117	112	112
114	112	107	107
112	112	102	102
111	110		
108	110		
102	105		
102	105		
101	102		

APPENDIX II

MEDIAN TEST

CONTINGENCY TABLES

MEDIANS

AND CHI SQUARES

TABLE 7

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR GROUPS I AND II (HIGH- AND MODERATE-ACHIEVING STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE EDWARDS PPS

Achievement

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	13	6	19	17	16	33	30	22	52
At or Below Median	7	14	21	18	19	37	25	33	58
Totals	20	20	40	35	35	70	55	55	110
Medians	17.000			14			15.000		
Chi Squares	3.609			/ 1			1.797		

Deference

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	10	9	19	20	14	34	30	23	53
At or Below Median	10	11	21	15	21	36	25	32	57
Totals	20	20	40	35	35	70	55	55	110
Medians	12			12.000			12.000		
Chi Squares	/ 1			1.429			1.130		

Order

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	8	11	19	17	15	32	25	26	51
At or Below Median	12	9	21	18	30	38	30	29	59
Totals	20	20	40	35	35	70	55	55	110
Medians	10			10			10		
Chi Squares	/ 1			/ 1			/ 1		

Exhibition

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	9	11	20	13	17	30	22	28	50
At or Below Median	11	9	20	22	18	40	33	27	60
Totals	20	20	40	35	35	70	55	55	110
Medians	13			12			12		
Chi Squares	/ 1			/ 1			/ 1		

Autonomy

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	8	9	17	12	17	29	24	28	52
At or Below Median	12	11	23	23	18	41	31	27	58
Totals	20	20	40	35	35	70	55	55	110
Medians	13			12			12		
Chi Squares	/ 1			/ 1			/ 1		

TABLE 7 Continued

Affiliation

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	8	6	14	12	18	30	23	27	50
At or Below Median	12	14	26	23	17	40	32	28	60
Totals	20	20	40	35	35	70	55	55	110
Medians	15			18.000			17		
Chi Squares	/ 1			1.458			/ 1		

Intraception

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	6	10	16	22	15	37	28	25	53
At or Below Median	14	10	24	13	20	33	27	30	55
Totals	20	20	40	35	35	70	55	55	110
Medians	17			17			17		
Chi Squares	/ 1			/ 1			/ 1		

Succorance

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	10	9	19	17	17	34	27	24	31
At or Below Median	10	11	21	18	18	36	28	31	39
Totals	20	20	40	35	35	70	55	55	110
Medians	11			12			12		
Chi Squares	/ 1			/ 1			/ 1		

Dominance

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	11	11	22	20	15	35	23	21	44
At or Below Median	9	9	18	15	20	35	32	34	66
Totals	20	20	40	35	35	70	55	55	110
Medians	16			13.5			15		
Chi Squares	/ 1			/ 1			/ 1		

Abasement

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	9	9	18	18	17	35	24	27	51
At or Below Median	11	11	22	17	18	35	31	28	59
Totals	20	20	40	35	35	70	55	55	110
Medians	13			16			15		
Chi Squares	/ 1			/ 1			/ 1		

TABLE 7 Continued

Nurturance

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	7	10	17	14	17	31	25	30	55
At or Below Median	13	10	23	21	18	39	30	25	55
Totals	20	20	40	35	35	70	55	55	110
Medians	14			18			16		
Chi Squares	/ 1			/ 1			/ 1		

Change

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	7	10	17	12	22	34	22	32	54
At or Below Median	13	10	23	23	13	36	33	23	56
Totals	20	20	40	35	35	70	55	55	110
Medians	15			16.00			15.00		
Chi Squares	/ 1			4.63			2.89		

Endurance

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	11	7	18	13	13	26	25	22	47
At or Below Median	9	13	22	22	22	44	30	33	63
Totals	20	20	40	35	35	70	55	55	110
Medians	15			14			14		
Chi Squares	/ 1			/ 1			/ 1		

Heterosexual

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	7	12	19	13	16	29	23	30	53
At or Below Median	13	8	21	22	19	41	32	25	57
Totals	20	20	40	35	35	70	55	55	110
Medians	12.00			15			14.00		
Chi Squares	1.60			/ 1			1.31		

Aggression

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	8	9	17	15	19	34	29	26	55
At or Below Median	12	11	23	20	16	36	26	29	55
Totals	20	20	40	35	35	70	55	55	110
Medians	13			9			10.5		
Chi Squares	/ 1			/ 1			/ 1		

TABLE 8

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IA AND IB (HIGH-ACHIEVING HIGH-ABILITY AND HIGH-ACHIEVING MODERATE-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE EDWARDS PPS

	Achievement			Deference			Order		
	IA	IB	T	IA	IB	T	IA	IB	T
Above Median	9	6	15	6	8	14	6	7	13
At or Below Median	6	9	15	9	7	16	9	8	17
Totals	15	15	30	15	15	30	15	15	30
Medians	16			15			10		
Chi Squares	/ 1			/ 1			/ 1		

	Exhibition			Autonomy			Affiliation		
	IA	IB	T	IA	IB	T	IA	IB	T
Above Median	8	6	14	5	10	15	8	6	14
At or Below Median	7	9	16	10	5	15	7	9	16
Totals	15	15	30	15	15	30	15	15	30
Medians	13			11.50			17		
Chi Squares	/ 1			2.13			/ 1		

	Intraception			Succorance			Dominance		
	IA	IB	T	IA	IB	T	IA	IB	T
Above Median	6	7	13	8	5	13	13	2	15
At or Below Median	9	8	17	7	10	17	2	13	15
Totals	15	15	30	15	15	30	15	15	30
Medians	18			12			15.50		
Chi Squares	/ 1			/ 1			13.33		

	Abasement			Nurturance			Change		
	IA	IB	T	IA	IB	T	IA	IB	T
Above Median	5	9	14	4	9	13	6	9	15
At or Below Median	10	6	16	11	6	17	9	6	15
Totals	15	15	30	15	15	30	15	15	30
Medians	15.00			16.00			14.50		
Chi Squares	1.20			2.17			/ 1		

	Endurance			Heterosexual			Aggression		
	IA	IB	T	IA	IB	T	IA	IB	T
Above Median	6	8	14	8	6	14	5	8	13
At or Below Median	9	7	16	7	9	16	10	7	17
Totals	15	15	30	15	15	30	15	15	30
Medians	12			13			11		
Chi Squares	/ 1			/ 1			/ 1		

TABLE 9

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IA AND IIA (HIGH-ACHIEVING HIGH-ABILITY AND MODERATE-ACHIEVING HIGH-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE EDWARDS PPS

	Achievement			Deference			Order		
	IA	IIA	T	IA	IIA	T	IA	IIA	T
Above Median	9	6	15	7	8	15	6	7	13
At or Below Median	6	9	15	8	7	15	9	8	17
Totals	15	15	30	15	15	30	15	15	30
Medians	15.5			10.5			10.0		
Chi Squares	/ 1			/ 1			/ 1		

	Exhibition			Autonomy			Affiliation		
	IA	IIA	T	IA	IIA	T	IA	IIA	T
Above Median	4	7	11	5	10	15	8	7	15
At or Below Median	11	8	9	10	5	15	7	8	15
Totals	15	15	30	15	15	30	15	15	30
Medians	15.0			11.50			17.5		
Chi Squares	/ 1			2.13			/ 1		

	Intraception			Succorance			Dominance		
	IA	IIA	T	IA	IIA	T	IA	IIA	T
Above Median	9	6	15	8	6	14	11	3	14
At or Below Median	6	9	15	7	9	16	4	12	16
Totals	15	15	30	15	15	30	15	15	30
Medians	16.5			11			15.00		
Chi Squares	/ 1			/ 1			6.56		

	Abasement			Nurturance			Change		
	IA	IIA	T	IA	IIA	T	IA	IIA	T
Above Median	7	7	14	7	8	15	5	8	12
At or Below Median	8	8	16	8	7	15	11	7	18
Totals	15	15	30	15	15	30	15	15	30
Medians	13			15.5			17.00		
Chi Squares	/ 1			/ 1			1.25		

	Endurance			Heterosexual			Aggression		
	IA	IIA	T	IA	IIA	T	IA	IIA	T
Above Median	6	6	12	5	10	15	7	8	15
At or Below Median	9	9	18	10	5	15	8	7	15
Totals	15	15	30	15	15	30	15	15	30
Medians	12			16.50			9.5		
Chi Squares	/ 1			2.13			/ 1		

TABLE 10

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IB AND IIB (HIGH-ACHIEVING MODERATE-ABILITY AND MODERATE-ACHIEVING MODERATE-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE EDWARDS PPS

	Achievement			Deference			Order		
	IB	IIB	T	IB	IIB	T	IB	IIB	T
Above Median	9	6	15	10	3	13	7	4	11
At or Below Median	6	9	15	5	12	17	8	11	19
Totals	15	15	30	15	15	30	15	15	30
Medians	13.5			14.00			10		
Chi Squares	/ 1			4.89			/ 1		

	Exhibition			Autonomy			Affiliation		
	IB	IIB	T	IB	IIB	T	IB	IIB	T
Above Median	6	9	15	10	5	15	7	7	14
At or Below Median	9	6	15	5	10	15	8	8	16
Totals	15	15	30	15	15	30	15	15	30
Medians	13.5			12.50			16		
Chi Squares	/ 1			2.13			/ 1		

	Intraception			Succorance			Dominance		
	IB	IIB	T	IB	IIB	T	IB	IIB	T
Above Median	7	5	12	5	6	11	2	9	11
At or Below Median	8	10	18	10	9	19	13	6	19
Totals	15	15	30	15	15	30	15	15	30
Medians	18			12			15.00		
Chi Squares	/ 1			/ 1			5.17		

	Abasement			Nurturance			Change		
	IB	IIB	T	IB	IIB	T	IB	IIB	T
Above Median	8	6	14	7	6	13	7	6	13
At or Below Median	7	9	16	8	9	17	8	9	17
Totals	15	15	30	15	15	30	15	15	30
Medians	16			18			15		
Chi Squares	/ 1			/ 1			/ 1		

	Endurance			Heterosexual			Aggression		
	IB	IIB	T	IB	IIB	T	IB	IIB	T
Above Median	6	8	14	5	6	11	8	5	13
At or Below Median	9	7	16	10	9	19	7	10	17
Totals	15	15	30	15	15	30	15	15	30
Medians	14			14			11		
Chi Squares	/ 1			/ 1			/ 1		

TABLE 11

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IIA AND IIB (MODERATE-ACHIEVING HIGH-ABILITY AND MODERATE-ACHIEVING MODERATE-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE EDWARDS PPS

	Achievement			Deference			Order		
	IIA	IIB	T	IIA	IIB	T	IIA	IIB	T
Above Median	6	6	12	8	7	15	8	7	15
At or Below Median	9	9	18	7	8	15	7	8	15
Totals	15	15	30	15	15	30	15	15	30
Medians	15			10.5			9.5		
Chi Squares	/ 1			/ 1			/ 1		

	Exhibition			Autonomy			Affiliation		
	IIA	IIB	T	IIA	IIB	T	IIA	IIB	T
Above Median	7	6	13	10	5	15	8	7	15
At or Below Median	8	9	17	5	10	15	7	8	15
Totals	15	15	30	15	15	30	15	15	30
Medians	15			12.50			16.5		
Chi Squares	/ 1			2.13			/ 1		

	Intraception			Succorance			Dominance		
	IIA	IIB	T	IIA	IIB	T	IIA	IIB	T
Above Median	4	8	12	6	9	12	3	9	12
At or Below Median	11	7	18	9	6	15	12	6	18
Totals	15	15	30	15	15	30	15	15	30
Medians	17.01			11.50			15.00		
Chi Squares	1.25			/ 1			3.47		

	Abasement			Nurturance			Change		
	IIA	IIB	T	IIA	IIB	T	IIA	IIB	T
Above Median	7	8	15	6	8	14	8	4	12
At or Below Median	8	7	15	9	7	16	7	11	18
Totals	15	15	30	15	15	30	15	15	30
Medians	14.50			17.00			17.06		
Chi Squares	/ 1			/ 1			1.25		

	Endurance			Heterosexual			Aggression		
	IIA	IIB	T	IIA	IIB	T	IIA	IIB	T
Above Median	3	8	11	11	3	14	7	8	15
At or Below Median	12	7	19	4	12	16	8	7	15
Totals	15	15	30	15	15	30	15	15	30
Medians	14.00			16.00			10.50		
Chi Squares	2.30			6.56			/ 1		

TABLE 12

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IB AND IIA (HIGH-ACHIEVING MODERATE-ABILITY AND MODERATE-ACHIEVING HIGH-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE EDWARDS PPS

	Achievement			Deference			Order		
	IB	IIA	T	IB	IIA	T	IB	IIA	T
Above Median	6	6	12	10	3	13	7	7	14
At or Below Median	9	9	18	5	12	17	8	8	16
Totals	15	15	30	15	15	30	15	15	30
Medians	15			14.00			10		
Chi Squares	/ 1			4.89			/ 1		

	Exhibition			Autonomy			Affiliation		
	IB	IIA	T	IB	IIA	T	IB	IIA	T
Above Median	4	7	11	10	5	15	7	8	15
At or Below Median	11	8	19	5	10	15	8	7	15
Totals	15	15	30	15	15	30	15	15	30
Medians	15			11.50			16.5		
Chi Squares	/ 1			2.13			/ 1		

	Intraception			Succorance			Dominance		
	IB	IIA	T	IB	IIA	T	IB	IIA	T
Above Median	9	6	15	8	6	14	6	9	15
At or Below Median	6	9	15	7	9	16	9	6	15
Totals	15	15	30	15	15	30	15	15	30
Medians	16.5			11			12.5		
Chi Squares	/ 1			/ 1			/ 1		

	Abasement			Nurturance			Change		
	IB	IIA	T	IB	IIA	T	IB	IIA	T
Above Median	8	6	14	8	6	14	4	8	12
At or Below Median	7	9	16	7	9	16	11	7	18
Totals	15	15	30	15	15	30	15	15	30
Medians	16			17			17.00		
Chi Squares	/ 1			/ 1			1.25		

	Endurance			Heterosexual			Aggression		
	IB	IIA	T	IB	IIA	T	IB	IIA	T
Above Median	8	6	14	4	11	15	8	6	14
At or Below Median	7	9	16	11	4	15	7	9	16
Totals	15	15	30	15	15	30	15	15	30
Medians	12			15.5			11		
Chi Squares	/ 1			4.8			/ 1		

TABLE 13

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IA AND IIB (HIGH-ACHIEVING HIGH-ABILITY AND MODERATE-ACHIEVING MODERATE-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE EDWARDS PPS

	Achievement			Deference			Order		
	IA	IIB	T	IA	IIB	T	IA	IIB	T
Above Median	9	6	15	7	7	14	6	4	10
At or Below Median	6	9	15	8	8	16	9	11	20
Totals	15	15	30	15	15	30	15	15	30
Medians	15.5			10			10		
Chi Squares	/ 1			/ 1			/ 1		

	Exhibition			Autonomy			Affiliation		
	IA	IIB	T	IA	IIB	T	IA	IIB	T
Above Median	6	7	13	5	9	14	6	8	14
At or Below Median	9	8	17	10	6	16	9	7	16
Totals	15	15	30	15	15	30	15	15	30
Medians	14			11.00			17		
Chi Squares	/ 1			1.20			/ 1		

	Intraception			Succorance			Dominance		
	IA	IIB	T	IA	IIB	T	IA	IIB	T
Above Median	6	5	11	8	6	14	7	6	13
At or Below Median	9	10	19	7	9	16	8	9	17
Totals	15	15	30	15	15	30	15	15	30
Medians	18			12			18		
Chi Squares	/ 1			/ 1			/ 1		

	Abasement			Nurturance			Change		
	IA	IIB	T	IA	IIB	T	IA	IIB	T
Above Median	6	8	14	4	9	13	6	8	14
At or Below Median	9	7	16	11	6	17	9	7	16
Totals	15	15	30	15	15	30	15	15	30
Medians	14.5			16.00			14		
Chi Squares	/ 1			1.39			/ 1		

	Endurance			Heterosexual			Aggression		
	IA	IIB	T	IA	IIB	T	IA	IIB	T
Above Median	6	8	14	8	6	14	7	8	15
At or Below Median	9	7	16	7	9	16	8	7	15
Totals	15	15	30	15	15	30	15	15	30
Medians	14			14			10.5		
Chi Squares	/ 1			/ 1			/ 1		

TABLE 14

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR GROUPS I AND II (HIGH- AND MODERATE-ACHIEVING STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE AVL STUDY OF VALUES

Theoretical

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	8	12	20	17	17	34	27	26	53
At or Below Median	12	8	20	18	18	36	28	29	57
Totals	20	20	40	35	35	70	55	55	110
Medians	40.5			35			36		
Chi Squares	/ 1			/ 1			/ 1		

Economic

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	10	10	20	14	20	34	22	27	49
At or Below Median	10	10	20	21	15	36	33	28	61
Totals	20	20	40	35	35	70	55	55	110
Medians	37.5			35.00			37		
Chi Squares	/ 1			1.43			/ 1		

Aesthetic

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	10	10	20	16	19	35	26	25	51
At or Below Median	10	10	20	19	16	35	29	30	59
Totals	20	20	40	35	35	70	55	55	110
Medians	32.5			38.5			37		
Chi Squares	/ 1			/ 1			/ 1		

Social

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	10	10	20	17	18	35	26	26	52
At or Below Median	10	10	20	18	17	35	29	29	58
Totals	20	20	40	35	35	70	55	55	110
Medians	35.5			39.5			38		
Chi Squares	/ 1			/ 1			/ 1		

TABLE 14 Continued

Political

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	8	12	20	22	13	35	26	23	49
At or Below Median	12	8	20	13	22	35	29	32	61
Totals	20	20	40	35	35	70	55	55	110
Medians	35.5			38.50			37		
Chi Squares	/ 1			2.99			/ 1		

Religious

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	9	7	16	16	13	29	28	23	51
At or Below Median	11	13	24	19	22	41	27	32	59
Totals	20	20	40	35	35	70	55	55	110
Medians	52			55			54		
Chi Squares	/ 1			/ 1			/ 1		

TABLE 15

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IA AND IB (HIGH-ACHIEVING HIGH-ABILITY AND HIGH-ACHIEVING MODERATE-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE AVL STUDY OF VALUES

	Theoretical			Economic			Aesthetic		
	IA	IB	T	IA	IB	T	IA	IB	T
Above Median	8	6	14	7	8	15	8	6	14
At or Below Median	7	9	16	8	7	15	7	9	16
Totals	15	15	30	15	15	30	15	15	30
Medians	36			33.5			36		
Chi Squares	/ 1			/ 1			/ 1		

	Social			Political			Religious		
	IA	IB	T	IA	IB	T	IA	IB	T
Above Median	7	7	14	4	9	13	8	5	13
At or Below Median	8	8	16	11	6	17	7	10	17
Totals	15	15	30	15	15	30	15	15	30
Medians	37			38.00			55		
Chi Squares	/ 1			2.17			/ 1		

TABLE 16

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IA AND IIA (HIGH-ACHIEVING HIGH-ABILITY AND MODERATE-ACHIEVING HIGH-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE AVL STUDY OF VALUES

	Theoretical			Economic			Aesthetic		
	IA	IIA	T	IA	IIA	T	IA	IIA	T
Above Median	7	7	14	8	7	15	5	10	15
At or Below Median	8	8	16	7	8	15	10	5	15
Totals	15	15	30	15	15	30	15	15	30
Medians	37			34.5			40.50		
Chi Squares	/ 1			/ 1			2.13		

	Social			Political			Religious		
	IA	IIA	T	IA	IIA	T	IA	IIA	T
Above Median	7	7	14	7	6	13	10	4	14
At or Below Median	8	8	16	8	9	17	5	11	16
Totals	15	15	30	15	15	30	15	15	30
Medians	37			36			54.00		
Chi Squares	/ 1			/ 1			3.35		

TABLE 17

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IB AND IIB (HIGH-ACHIEVING MODERATE-ABILITY AND MODERATE-ACHIEVING MODERATE-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE AVL STUDY OF VALUES

	Theoretical			Economic			Aesthetic		
	IB	IIB	T	IB	IIB	T	IB	IIB	T
Above Median	8	6	14	4	8	12	9	5	14
At or Below Median	7	9	16	11	7	18	6	10	16
Totals	15	15	30	15	15	30	15	15	30
Medians	35			38.00			34.00		
Chi Squares	/ 1			1.25			1.21		

	Social			Political			Religious		
	IB	IIB	T	IB	IIB	T	IB	IIB	T
Above Median	6	8	14	6	7	13	7	8	15
At or Below Median	9	7	16	9	8	13	8	7	15
Totals	15	15	30	15	15	30	15	15	30
Medians	39			39			54.5		
Chi Squares	/ 1			/ 1			/ 1		

TABLE 18

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IIA AND IIB (MODERATE-ACHIEVING HIGH-ABILITY AND MODERATE-ACHIEVING MODERATE-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE AVL STUDY OF VALUES

	Theoretical			Economic			Aesthetic		
	IIA	IIB	T	IIA	IIB	T	IIA	IIB	T
Above Median	8	6	14	5	10	15	10	4	14
At or Below Median	7	9	16	10	5	15	5	11	16
Totals	15	15	30	15	15	30	15	15	30
Medians	35			37.00			37.00		
Chi Squares	/ 1			2.13			3.35		

	Social			Political			Religious		
	IIA	IIB	T	IIA	IIB	T	IIA	IIB	T
Above Median	5	9	14	6	8	14	4	10	14
At or Below Median	10	6	16	9	7	16	11	5	16
Totals	15	15	30	15	15	30	15	15	30
Medians	38.00			36			52.00		
Chi Squares	1.21			/ 1			3.35		

TABLE 19

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IB AND IIA (HIGH-ACHIEVING MODERATE-ABILITY AND MODERATE-ACHIEVING HIGH-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE AVL STUDY OF VALUES

	Theoretical			Economic			Aesthetic		
	IB	IIA	T	IB	IIA	T	IB	IIA	T
Above Median	6	9	14	8	7	15	5	10	15
At or Below Median	9	7	16	7	8	15	10	5	15
Totals	15	15	30	15	15	30	15	15	30
Medians	36			35			37.50		
Chi Squares	/ 1			/ 1			2.13		

	Social			Political			Religious		
	IB	IIA	T	IB	IIA	T	IB	IIA	T
Above Median	7	7	14	9	6	15	9	4	13
At or Below Median	8	8	16	6	9	15	6	11	17
Totals	15	15	30	15	15	30	15	15	30
Medians	37			38.5			52		
Chi Squares	/ 1			/ 1			/ 1		

TABLE 20

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IA AND IIB (HIGH-ACHIEVING HIGH-ABILITY AND MODERATE-ACHIEVING MODERATE-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE AVL STUDY OF VALUES

	Theoretical			Economic			Aesthetic		
	IA	IIB	T	IA	IIB	T	IA	IIB	T
Above Median	8	6	14	4	9	13	10	5	15
At or Below Median	7	9	16	11	6	17	5	10	15
Totals	15	15	30	15	15	30	15	15	30
Medians	35			38.00			34.50		
Chi Squares	/ 1			2.17			2.13		

	Social			Political			Religious		
	IA	IIB	T	IA	IIB	T	IA	IIB	T
Above Median	5	9	14	5	8	13	8	7	15
At or Below Median	10	6	16	10	7	17	7	8	15
Totals	15	15	30	15	15	30	15	15	30
Medians	38.00			37			55.5		
Chi Squares	1.20			/ 1			/ 1		

TABLE 21

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR GROUPS I AND II (HIGH- AND MODERATE-ACHIEVING STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE STRONG VIB

Occupational Level

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	14	6	20	22	13	35	34	21	55
At or Below Median	6	14	20	13	22	35	21	24	55
Totals	20	20	40	35	35	70	55	55	110
Medians	34.50			40.50			39.50		
Chi Squares	4.90			3.66			5.23		

Specialization Level

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	8	11	19	21	14	35	29	25	54
At or Below Median	12	9	21	14	21	35	26	30	56
Totals	20	20	40	35	35	70	55	55	110
Medians	17.00			13.00			14.00		
Chi Squares	/ 1			2.06			/ 1		

Masculine-Feminine

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	9	11	20	19	16	35	26	29	55
At or Below Median	11	9	20	16	19	35	29	26	55
Totals	20	20	40	35	35	70	55	55	110
Medians	23.50			-114.50			-77.50		
Chi Squares	/ 1			/ 1			/ 1		

Interest Maturity

	Male			Female			Combined Sexes		
	I	II	T	I	II	T	I	II	T
Above Median	8	11	19	24	11	35	31	23	54
At or Below Median	12	9	21	11	24	35	24	32	56
Totals	20	20	40	35	35	70	55	55	110
Medians	78.50			91.00			82.00		
Chi Squares	/ 1			8.23			1.78		

TABLE 22

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IA AND IB (HIGH-ACHIEVING HIGH-ABILITY AND HIGH-ACHIEVING MODERATE-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE STRONG VIB

	Occupational Level			Specialization Level		
	IA	IB	T	IA	IB	T
Above Median	10	5	15	12	3	15
At or Below Median	5	10	15	3	12	15
Totals	15	15	30	15	15	30
Medians	47.00			13.50		
Chi Squares	2.13			8.53		

	Masculine-Feminine			Interest Maturity		
	IA	IB	T	IA	IB	T
Above Median	5	10	15	10	5	15
At or Below Median	10	5	15	5	10	15
Totals	15	15	30	15	15	30
Medians	-107.50			98.50		
Chi Squares	2.13			2.13		

TABLE 23

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IA AND IIA (HIGH-ACHIEVING HIGH-ABILITY AND MODERATE-ACHIEVING HIGH-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE STRONG VIB

	Occupational Level			Specialization Level		
	IA	IIA	T	IA	IIA	T
Above Median	10	5	15	8	9	17
At or Below Median	5	10	15	7	6	13
Totals	15	15	30	15	15	30
Medians	42.00			24.00		
Chi Squares	2.13			/ 1		

	Masculine-Feminine			Interest Maturity		
	IA	IIA	T	IA	IIA	T
Above Median	6	9	15	10	5	15
At or Below Median	9	6	15	5	10	15
Totals	15	15	30	15	15	30
Medians	-111			98.00		
Chi Squares	/ 1			2.13		

TABLE 24

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IB AND IIB (HIGH-ACHIEVING MODERATE-ABILITY AND MODERATE-ACHIEVING MODERATE-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE STRONG VIB

	Occupational Level			Specialization Level		
	IB	IIB	T	IB	IIB	T
Above Median	8	7	15	7	8	15
At or Below Median	7	8	15	8	7	15
Totals	15	15	30	15	15	30
Medians	35.0			10.5		
Chi Squares	/ 1			/ 1		

	Masculine-Feminine			Interest Maturity		
	IB	IIB	T	IB	IIB	T
Above Median	7	8	15	8	7	15
At or Below Median	8	7	15	7	8	15
Totals	15	15	30	15	15	30
Medians	-72			60		
Chi Squares	/ 1			/ 1		

TABLE 25

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IIA AND IIB (MODERATE-ACHIEVING HIGH-ABILITY AND MODERATE-ACHIEVING MODERATE-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE STRONG VIB

	Occupational Level			Specialization Level		
	IIA	IIB	T	IIA	IIB	T
Above Median	4	8	12	11	4	15
At or Below Median	11	7	18	4	11	15
Totals	15	15	30	15	15	30
Medians	29.00			24.00		
Chi Squares	1.25			4.80		

	Masculine-Feminine			Interest Maturity		
	IIA	IIB	T	IIA	IIB	T
Above Median	5	10	15	10	5	15
At or Below Median	10	5	15	5	10	15
Totals	15	15	30	15	15	30
Medians	-99.00			74.00		
Chi Squares	2.13			2.13		

TABLE 26

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IB AND IIA (HIGH-ACHIEVING MODERATE-ABILITY AND MODERATE-ACHIEVING HIGH-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE STRONG VIB

	Occupational Level			Specialization Level		
	IB	IIA	T	IB	IIA	T
Above Median	10	4	14	3	11	14
At or Below Median	5	11	16	12	4	16
Totals	15	15	30	15	15	30
Medians	29.00			13.00		
Chi Squares	3.35			8.57		

	Masculine-Feminine			Interest Maturity		
	IB	IIA	T	IB	IIA	T
Above Median	10	5	15	6	9	15
At or Below Median	5	10	15	9	6	15
Totals	15	15	30	15	15	30
Medians	-107.50			89.50		
Chi Squares	2.13			< 1		

TABLE 27

MEDIAN TEST CONTINGENCY TABLES, MEDIANS, AND CHI SQUARES FOR SUB-GROUPS IA AND IIB (HIGH-ACHIEVING HIGH-ABILITY AND MODERATE-ACHIEVING MODERATE-ABILITY STUDENTS) AT O.B.U. FOR THE VARIABLES MEASURED BY THE STRONG VIB

	Occupational Level			Specialization Level		
	IA	IIB	T	IA	IIB	T
Above Median	9	6	15	10	5	15
At or Below Median	6	9	15	5	10	15
Totals	15	15	30	15	15	30
Medians	52.00			18.50		
Chi Squares	< 1			2.13		

	Masculine-Feminine			Interest Maturity		
	IA	IIB	T	IA	IIB	T
Above Median	10	5	15	11	4	15
At or Below Median	5	10	15	4	11	15
Totals	15	15	30	15	15	30
Medians	99.00			87.50		
Chi Squares	2.13			4.82		