

6-1964

Correlation between some of the Cattell objective-analytic personality tests and biographical data

Ronald Nixon Taylor
University of Nebraska at Omaha

Follow this and additional works at: <https://digitalcommons.unomaha.edu/studentwork>

 Part of the [Psychology Commons](#)

Recommended Citation

Taylor, Ronald Nixon, "Correlation between some of the Cattell objective-analytic personality tests and biographical data" (1964).
Student Work. 259.
<https://digitalcommons.unomaha.edu/studentwork/259>

This Thesis is brought to you for free and open access by DigitalCommons@UNO. It has been accepted for inclusion in Student Work by an authorized administrator of DigitalCommons@UNO. For more information, please contact unodigitalcommons@unomaha.edu.



CORRELATION BETWEEN SOME OF THE CATTELL
OBJECTIVE-ANALYTIC PERSONALITY TESTS
AND BIOGRAPHICAL DATA

by

Ronald Nixon Taylor

A Thesis

Presented to

the Graduate Faculty of the Department of Psychology
University of Omaha

In Partial Fulfillment

of the Requirements for the Degree

Master of Arts

June 1964

UMI Number: EP72891

All rights reserved

INFORMATION TO ALL USERS

The quality of this reproduction is dependent upon the quality of the copy submitted.

In the unlikely event that the author did not send a complete manuscript and there are missing pages, these will be noted. Also, if material had to be removed, a note will indicate the deletion.



UMI EP72891

Published by ProQuest LLC (2015). Copyright in the Dissertation held by the Author.

Microform Edition © ProQuest LLC.

All rights reserved. This work is protected against unauthorized copying under Title 17, United States Code



ProQuest LLC.
789 East Eisenhower Parkway
P.O. Box 1346
Ann Arbor, MI 48106 - 1346

TABLE OF CONTENTS

| CHAPTER | PAGE |
|--|------|
| I. THE PROBLEM AND DEFINITIONS OF TERMS USED . | 1 |
| Statement of the Problem | 2 |
| Importance of this Study | 3 |
| Definitions of Terms Used | 5 |
| Personality | 5 |
| Biographical Data | 5 |
| Objective Test | 6 |
| Organization of Remainder of the Thesis . | 7 |
| II. REVIEW OF THE LITERATURE | 8 |
| Literature on Objective Personality Tests | 9 |
| Concept of Objectivity | 9 |
| Scope of the Review | 12 |
| Trend Toward Objectivity in Personality Testing | 15 |
| Literature on Biographical Data | 45 |
| III. DESIGN OF RESEARCH | 52 |
| Group Studied | 52 |
| Test Materials and Methods Used | 54 |
| Variables Measured | 54 |
| Methods of Administration | 70 |
| Biographical Data Categories and Methods Used | 70 |
| Biographical Data Categories | 71 |
| Methods of Obtaining Biographical Data . | 74 |

| CHAPTER | PAGE |
|--------------------------------------|------|
| IV. RESULTS AND DISCUSSION | 77 |
| Results | 77 |
| Discussion | 90 |
| V. SUMMARY | 93 |
| BIBLIOGRAPHY | 98 |

LIST OF TABLES

| TABLE | PAGE |
|--|------|
| 1. Primary Personality Factors | 37 |
| 2. Sixteen Personality Questionnaire Factors | 39 |
| 3. Variables from Tests Used | 55 |
| 4. Summary of Biographical Data Obtained . . | 72 |
| 5. Intercorrelations for Test Scores and Biographical Data | 78 |
| 6. Intercorrelations for Test Scores with Drop-out and Fraternity Membership . . | 79 |
| 7. Means and Standard Deviations for Variables Based on Sixteen Subjects | 81 |
| 8. Means and Standard Deviations for Variables Based on Twenty-six Subjects | 82 |

CHAPTER I

THE PROBLEM AND DEFINITIONS OF TERMS USED

Although there is little agreement as to the exact definition of the term "personality", there is almost universal agreement as to the wide scope encompassed by this term and the tremendous influence of the personalities of individuals in every area of their lives and on the lives of those around them. Its importance in college activities, as in all other areas of behavior, can scarcely be denied.

This importance of personality calls for the best efforts of science to comprehend it and to devise a means of measuring it. The task of description and measurement of personality is filled with a lack of preciseness in theory and need for experimental research with measuring instruments. There has been much controversy as to the best means of measuring personality, but objective tests appear to be a significant advance in accomplishing this task.

Little has been done to relate personality variables to the behavior of college students; yet this readily accessible group offers a fertile field for personality research. A great majority of research concerning assessment of college achievement uses academic measures of achievement. Relatively few

attempts have been made to relate objectively measured personality traits to achievement in extracurricular activities. To this end the present thesis was addressed.

I. STATEMENT OF THE PROBLEM

The purpose of this study was to examine the correlations between selected personality variables of entering students, measured by objective tests, and the degree of participation by these students in selected areas of college life. Two kinds of correlations were obtained and examined for significant relationships: 1) correlations between the degree of participation in one area of college life and degree of participation in other areas; and 2) correlations between personality test scores and the degree of participation in the sampled college activities.

II. IMPORTANCE OF THIS STUDY

A great volume of research has been published concerning the diversity of intellectual abilities among college students. Such studies typically involved the use of scholastic aptitude as a predictor of grades in academic subjects. Measuring mental abilities in this manner is useful in analyzing student characteristics related to academic achievement, but the academic

average is not the only criterion of a student's achievement in college. In the context of liberal education, the nonintellective characteristics possessed by college students are also of concern.

This study employed a somewhat unusual approach to the traditional task of evaluating student achievement in college in that it was concerned with the analysis of nonintellective characteristics. The predictors selected were measures of student personality traits scored from a series of tests advertised as more objective than the widely used self-report devices. These tests were developed by Raymond B. Cattell and are labeled the Objective Analytic Personality Tests (OAPT). The distinction between tests of this type and the self-report inventories and questionnaires has been brought out in Chapter II of this thesis.

The real life behavior chosen as the criteria was also nonintellective in nature. This consisted of an examination of the student's degree of participation in activities in several general areas of college life. This study gave broad coverage to these relatively unexplored extracurricular activities by systematically examining the number of social, athletic, part-time work, and leadership activities in which the student participated; as well as noting students

who attained outstanding scholastic honors.

The importance of this thesis was based upon its unique nature, but beyond this aspect, the application of its findings was of primary significance. Examining statistically significant correlations between the objective personality test scores of freshmen and their degree of participation in the sampled areas of college life revealed interrelationships between personality and behavior in the educational setting. Thus, a student's potential for engaging in campus activities or becoming a campus leader, for example, could be discovered at the time of first registration.

With the current emphasis upon developing the total student and awareness of the importance of social adjustment, such information is of obvious value. Not only would counseling on the basis of such information contribute to campus adjustment, but studies by American Telephone and Telegraph and others pointed to the value of campus activities in developing future business leaders. Therefore, counseling can be directed toward helping the student to become aware of his personality and potential for social and leadership development, and the importance of such attributes in pursuing his chosen vocation.

III. DEFINITION OF TERMS USED

Several terms used in this thesis have a variety of definitions in common use among both laymen and psychologists. To eliminate any ambiguity as to the specific meaning intended by their use in this study, this section has been devoted to the definition of these terms.

Personality. Raymond B. Cattell defined personality in terms of a "personality sphere". This he conceived as "a sphere in hyperspace the surface of which contains areas corresponding to all forms of human behavior." (13, p. 898). When discussing personality assessment Cattell delineated three trait modalities; abilities (including achievement and skill), personality temperament traits, and interest and attitude traits (13, p. 765). The tests selected from the OAPT for use in this study were in all of these categories, but were predominantly tests of personality temperament traits. When this meaning was intended, the term temperament was used.

Biographical Data. Biographical data referred to facts gathered from the history of the lives of individuals. In this study, the biographical data obtained was limited to events occurring during a two and one-half year span of their college lives and

pertaining to the five areas of behavior; scholarship, athletics, leadership, social, and part-time work. The degree of participation in activities of each area provided the criteria of college behavior with which the selected personality variables were correlated.

Objective Test. An objective test was defined by Cronbach as a "systematic procedure for comparing the behavior of two or more persons in which every observer seeing a performance arrives at precisely the same report" (15, p. 21). This definition distinguished the projective techniques from the more objective tests in which responses to test stimuli were scored without allowing error of judgment to enter.

Cattell insisted upon another requirement of an objective test. The subject must also be kept unaware of how his responses are to be scored to eliminate the possibility of his influencing his responses to give the appearance he desires. Cattell's OAPT are more objective in this respect than the frequently used inventories and questionnaires since they assess personality by inferring traits from responses to items which call for judgments, opinions, and the use of other abilities rather than a direct self-report.

IV. ORGANIZATION OF THE REMAINDER OF THE THESIS

The remainder of this thesis has been organized in the manner described in this section. The next chapter contains a survey of the literature concerning objective personality tests and the use of biographical criteria in determining the degree of participation in college activities. This was followed by a description of the design used in this research; including, the group studied, the tests used, the administrative methods followed, the biographical data obtained, and how this was gathered. Next, the results were analyzed to determine the meaningful relationships present in this data. This was followed by a summary of these results and the conclusions drawn from these results.

CHAPTER II

REVIEW OF THE LITERATURE

The two distinct areas linked by this study, objectivity in personality testing and biographical information about college activities, each has its own historical background. Thus it was most appropriate to discuss them separately in this chapter. First, objective personality testing was covered. The origin of the concept of personality was mentioned briefly; then the meaning of objectivity and the trend toward objectivity in personality testing, from its origin in Galton's work to the recent OAPT by Cattell, was discussed. In tracing this trend, every effort was made to give sufficient thoroughness of coverage to include all pertinent developments without including irrelevant items.

Next, the use of biographical data as a measure of participation in college activities was surveyed. In contrast to the tremendous volume of literature on objective personality testing, relatively little has been written about the use of biographical information in the systematic analysis of participation by students in the areas of college life. Even less has been published concerning the relationship of temperament variables and biographical information.

I. LITERATURE ON OBJECTIVE PERSONALITY TESTS

Personality is a very old term with many meanings. Allport reports that the word "personality" had its origin in the Latin word "persona" which was a mask used by early Greek actors. In time, the term "persona" came to apply to the actor and later to all individuals. Perhaps this was because they realized, as expressed by Shakespeare, that: "all the world's a stage and all men and women merely players" (23, p. 2).

Another point of general agreement is that personality is of great importance to everyone. Thus, every effort must be made to understand it and devise measures of it. In doing this, the scientific study of personality is distinguished by consideration of reliability, validity, and objectivity (40, p. 41). Each of these is regarded as necessary in scientific study, but the concern for the latter was the central theme of this survey of the historical literature in the field of objective personality testing.

Concept of Objectivity. Objectivity has long been a major goal of science. The philosopher, Herbert Feigl, wrote these thoughts about what he termed "intersubjective testability":

The term intersubjective stresses the social nature of the scientific enterprise. If there be any truths that are accessible only to privileged individuals,

such as mystics or visionaries--that is . . . claims which by their very nature cannot independently be checked by anyone else--then such truths are not of the kind we seek in the sciences. The criterion of intersubjective testability thus delimits the scientific from the nonscientific activities of man (17, p. 11).

To this point objectivity has been presented as a standard of all sciences. Now an examination of some current conceptions of objectivity as it relates to personality testing is in order. In reply to the question, "What do you consider to be the meaning of objective approaches to personality assessment, with special emphasis upon the qualifying term objective" (3, p. 14), a number of leading authorities gave these answers. Complete independence from examiner effects was the single criterion of objectivity stated by Bass. Berg felt that it meant scorable, fairly clearly structured tests for which scoring would be identical if performed by competent persons. Edwards also mentioned the strictly defined method of scoring. McQuitty believed it meant isolating individual differences in such a way that numbers can be applied, resulting in a similar classification of measurement of behavior by different users of the approach. Pepinsky disclaimed the use of the term objective but gave two criteria of what he thought was commonly meant by objectivity. These were; 1) minimization of variability

in the task conditions on separate occasions, and
 2) minimization of errors of observing and recording.
 These statements stressed objectivity as a condition
 of interaction of test material and examiner. Thus,
 for these authorities, objectivity involved both the
 stimuli and the scoring of responses (3, p. 14).

Super went beyond this conception by stating
 that a test can be objective in any of three ways;
 1) its stimulus, 2) the response it permits, and 3)
 the scoring method used. He also stated:

By this definition the tests
 we actually use are scattered along
 a continuum, and judgment as to
 whether a particular test is objective
 or otherwise is somewhat arbitrary (3, p. 15).

Cattell gave a more specific meaning than do
 the others. He defined an objective test as, "a test
 in which the subject's behavior is measured, for
 inferring personality, without his being aware in
 what ways his behavior is likely to affect the inter-
 pretation" (3, p. 15). So Cattell added a fourth
 condition of objectivity to those mentioned previously;
 the test must be deceptive enough that the subject will
 be unable to fake his responses (13, p. 897).

Based upon the degree to which they satisfy
 each of these criteria all tests can be placed upon
 a continuum of objective vs. subjective. Any line
 drawn to distinguish these two categories must be

somewhat arbitrary, because as Holtzman has illustrated by his work with the Rorschach, even clearly projective tests can benefit from the application of the principles of objectivity (28, p. 119). Thus, in the final analysis, any determination of an objective test must be based upon its relative degree of adherence to these conditions of objectivity.

Scope of Review. In investigating the field of objective personality testing, one must rigorously define the specific techniques with which his study is concerned and exclude from his survey all material not highly relevant to this area. This precaution was necessary because of the bewildering array of personality assessment techniques and the variety of often overlapping and seldom clear-cut categories into which these are segregated. In this survey the primary concern was the trend toward objectivity in personality testing. This trend has been traced from its origin in the early psychological testing of Galton to the subject of this study, the recent OAPT developed by Cattell.

So that there was less ambiguity as to which of the numerous techniques were relevant to this discussion, and to justify their inclusion or omission, they were arranged into systematic groupings. Watson

pointed out the commonly used classifications of objective vs. projective were not dicotomus (52, p. 17). Although projective devices have traditionally been characterized by much less objectivity, projective test materials may be treated objectively. Also many so-called objective techniques do not meet the criteria of objectivity.

The classification system advocated by Anastasi of projective, self-report, and situational tests presents a more accurate picture. She realized, that the principle of objectivity could be used in all these devices to increase their effectiveness, but that the most highly objective tests were included in the self-report and situational tests (2, p. 33). The truly objective tests of these types were the subject of this study, and only these were included in this survey of the historical literature concerning objective personality tests.

The "typical" self-report test, generally called a questionnaire, or inventory, asks the examinee direct questions about himself and his opinions. These questions were usually about his habits, his feelings, his worries, or his preferences, but may refer to almost anything. The format used in most cases was a list of affirmative statements, but sometimes questions were used. Only two or three alternative answers, or

response choices, were available to the examinee, such as; "agree vs. disagree", "yes vs. no", or "true vs. false". Frequently, a middle category was used of "undertain", "cannot say", or "?" (23, p. 170). The inherent difficulty of this technique was that one could not assume that a self-report of a given action was a valid indicator that a person had performed or would perform the action defined. Often the person saw only a distorted picture of himself, or he exaggerated his more favorable characteristics (40, p. 64). Because of this weakness, these devices have been severely criticized by advocates of other methods of personality assessment.

A selected few of these self-report questionnaires and inventories were thought to be relevant to this survey and were included for several reasons. They were a necessary segment of the trend toward objectivity in personality testing because; they dominated a major period in its history, Cattell's questionnaires formed the basis for the development of the OAPT, and the self-concept tests from the OAPT were basically the same as an empirically validated self-report test (2, p. 496).

The objective personality assessment technique with which this survey was most directly concerned is the type of situational test described by Anastasi as

the artificial-task tests. These simple and comparatively objective tests were similar to the situational tests from which they developed, except the nature of the task was different. Where the situational tests utilized complex, lifelike, or realistic situations; the artificial-task tests presented the subject with an artificial task which bore little or no resemblance to the criterion to be predicted. Thus, they attempted to identify behavior which was a valid predictor of a criterion, but was not a direct sample of the criterion behavior. These tests also differed from the usual situational test in that most artificial-task tests were of the paper-and-pencil type (2, p. 649).

These tests were relatively recent in their development and there has been some confusion as to a uniform title. However, a number of test development programs are now underway which deal with this type of test. The OAPT, with which this research was concerned, is one of these programs.

Trend Toward Objectivity in Personality Testing.

One often finds that a label or heading used later in its development to refer to a concept or technique, was not used during its early stages. This was the case in objective personality testing. An examination of history disclosed that personality as we know it was

not a general classification of psychological tests in the early psychological traditions. Therefore, there was a lack of specific points of reference in the past. This did not prevent us from seeing from the perspective of the present, some of the aspects of what is now known as personality that were dealt with in the early history of psychological testing (3, p. 2). To place objective personality testing in its proper perspective, this review began with the relevant portions of the history of objective testing, not the history of objective personality testing, narrowly defined.

At the beginning of the history of psychological testing, in about 1880-1890, the mind was still the subject matter of psychology, and tests or personality were unknown. An examination of the system of classification of tests adopted by Whipple in his 1910 Manual of Mental and Physical Tests illustrates this point. The major headings were; physical and motor capacity, attention and perception, description and report, association learning and memory, suggestibility, imagination, invention, and intelligence. The so-called mental capacities were measured by what they considered mental tests (3, p. 2). Although personality was not mentioned as a classification, all of these headings are included within Cattell's personality sphere. However, the tests of suggestibility, imagin-

ation, description, report, and invention could be regarded as temperament tests in Cattell's test classification system.

Since the lack of any clear-cut classification of personality tests in psychological history has been indicated, an examination of the mental tests which were the forerunners of the present personality tests was in order.

Sir Francis Galton was generally considered the founder of individual psychology and the mental test (34, p. 5). Early interest in individual differences and their measurement resulted from his efforts. As early as 1882, Galton had founded a testing laboratory in London. There, for a small fee, he administered tests of reaction time and sensory acuity, along with a series of physical measurements (3, p. 3). Even at this early date people were interested in their standing in such measures.

Galton was primarily interested in an inventory of human abilities, which he related to his theories on evolution and the study of heredity. However, his various measures were intended to cover as wide a range of psychological characteristics as possible, and some of his efforts fit into the scope of temperament tests.

James McKeen Cattell also was instrumental in the founding of psychological testing, and the term

"mental test" was coined by him (34, p. 5). He advanced the concept of individual differences held by Galton and made it a prominent part of psychological research. In his work on testing, Cattell proposed a standard series of tests to be used for discovering the constancy of mental processes, their interdependence, and their variation under different circumstances (9, p. 618). These included a select list of ten tests, which he used at the Psychological Laboratory of the University of Pennsylvania, and a longer list of fifty others proposed for further study. The ten tests were dynamometer pressure, rate of movement, two-point threshold, pain sensitivity, least noticeable difference in weights, reaction time for sound, time in naming colors, bisection of a 50 cm. line, judgment of ten seconds time, and those numbers of letters repeated on one hearing. The longer list of fifty tests was essentially of the same types (9, p. 618).

In 1901, Clark Wissler reported the findings of several years research with these tests. Little correlation was indicated between the test results and academic class standing, and the intercorrelations among the tests themselves were also negligible. This was emphasized by the substantial correlations found between standing in the various college subjects. Shortly after this, another negative study was made

by Sharp in Titchener's laboratory (7, p. 573).

These disappointing results probably contributed greatly to the loss of interest in these tests. The testing movement that attempted to measure higher mental processes indirectly by tests of simple mental functions was largely discredited by the negative findings of these early studies.

To understand why testing developed in this way, one must realize the view held by the psychologists of that period as to the need for objectivity. They were not actively concerned with the problem of objectivity; possibly because their tests had originated in the laboratory. In the laboratory the process measured was defined by the material examined. Thus, reaction time devices measured reaction time and learning nonsense syllables was learning. These measures had what is now called content validity; that is, the degree to which the test samples the universe of content specified. They felt that to use measurements of reaction time as measures of intelligence because intelligence calls for speedy reaction, seemed reasonable and were not greatly concerned with the underlying theory. They did not realize that there was a great difference between observed behavior and construct (3, p. 5).

Generally, during this time psychology was still the study of mental functions by the method of intro-

spection. For example, objectivity was not even mentioned in Whipple's 1910 test manual. This very popular publication did, however, mention standardization of conditions and familiarity with instructions which are conducive to objectivity (3, p. 5). Neither was objectivity discussed as a topic in the literature and textbooks of that day. Perhaps this was because psychology was regarded as a subjective science, and therefore, the term objective would not pertain to it. But there are indications that they were acquainted with the problem. The centuries-old problem of the personal equation, which was later dealt with by psychologists, was proof of this awareness. Although it was not recognized as such, the training of the participants in their introspective methods was an attempt to accomplish the same purpose of increasing what is now known as objectivity (3, p. 5).

During the years from about 1900 to 1920, there was a notable lack of relevance of developments in the area of intelligence testing to temperament testing, except in England. This was due in part to the wide-spread influence of the work of Binet. Binet attacked the problem of psychological testing from the point of view that the specific tasks and items incorporated into a test made little difference as long as each was in some degree a measure of the individual's

general capacity (19, p. 77). In 1905 he worked with Simon to devise a series of mental tests for use in selecting mentally deficient students for special instruction. This scale attempted to measure complex abilities by using tests arranged in order of difficulty, and involving such tasks as the comparison of lines, the completion of sentences, and the comprehension of questions (34, p. 5). A great many users of these tests were primarily interested in the pragmatic application of these tests to social matters, such as mental retardation, and school placement, and were not concerned with other problems. Also, this interest in intelligence as a global concept was directly opposed to the trait concept that was later to prevail in personality study.

This lack of relevance of developments in the area of intelligence testing in the United States was not shared by England. It can be said that the British psychologists during this period followed more closely in the tradition of the laboratory approach. Perhaps this can be attributed to two factors. First, the work of Galton had considerable influence in that country and his students continued his efforts in the area of individual differences. The other factor was the statistical advancement made by Galton and Pearson originally, and later by Spearman and Burt. Britain

continued to progress along the lines of the earlier sensory and motor tests, and added other measures in the form of association tests (3, p. 7).

Spearman used statistical grounds to criticize the earlier testing methods. He pointed out that many earlier workers had failed to use quantitatively precise statements of the degree of correlation between their tests, failed to compute the probable error, and did not consider the errors of observation. Using his correlation between sensory tests and estimates of intelligence, Spearman also concluded that "branches of intellectual activity have in common one fundamental function" (41, p. 284). From this thinking, factor analysis was developed a few years later.

Factor analysis is a powerful statistical technique for dealing with large numbers of variables, which has been extremely useful in the development of objective tests of personality. A large group of factor analytic based tests have resulted from the ability of this tool to provide a closer approximation to the precise measurements needed for a study of such a complex system of variables as the traits of personality (14, p. 28).

Even at this early date the nonintellectual factors of personality were not ignored. In 1915,

Webb's analytic study based on ratings, yielded a W factor which was reported to be strength of character, or will. Also in that year, Burt reported on the interaction of ratings and emotions. (3, p. 7). Thus, the British psychologists in this period sought to mold objective testing into a new form.

Around 1911, the Russian reflexology came into being. It also stressed the objective approach and was often referred to as the Objective Psychology after Bekhterev's book by that name (3, p. 8). A few years later, Behaviorism appeared in the United States. Its appearance was dated by the work of John B. Watson, which began in 1913 with his articles, and culminated in 1919 with his publication of Psychology from the Standpoint of a Behaviorist (3, p. 7). Its emphasis on the objective approach had a tremendous effect on psychological testing.

By this time psychologists had realized that objectivity, as a standard of science, must be applied to their science. The term objective could then be used proudly as it is today. They no longer had to struggle with the difference between the objective sciences and the subjective science of psychology.

The way had been prepared for the appearance of tests of temperament in the form of performance tests. Much earlier Galton had written about the

the possibilities of this method in these words:

Emergencies need not be waited for, they can be extemporized: traps as it were, can be laid . . . After fixing upon some particular class of persons of similar age, sex, and social conditions, we have to find out what common incidents in their lives are most apt to make them betray their character. We may then take notes as often as we can, of what they do on these occasions, so as to arrive at their statistics of conduct in a limited number of well-defined small traits (3, p. 9).

Since this was published in 1884, it is possible that this was the first proposal for an objective temperament measure.

The Will-Temperament Test was an interesting behavior measure introduced by June Downey in 1919. As its title suggests, it was reported to measure what she called will-temperament. It consisted largely of handwriting samples taken under different conditions and thus, behavioral in nature. A sample of writing as obtained at ordinary speed, for a baseline; as rapidly as possible, to get a comparison with ordinary speed on the theory that those writing much slower than they can are subject to inhibition; in a different style, to measure flexibility; as slowly as possible, to measure motor inhibition or control; and so on. This test appealed to the desire for objectivity and was eagerly accepted. About fifty studies were performed with this test, in spite of the almost uniformly

negative results (3, p. 8). This test was important to this review because it is considered to be the first major performance measure of temperament.

This test was followed by other performance measures of temperament; such as Voelker's study of moral reactions to conduct, and the Character Education Inquiry by Hartshorne and May. The latter is a well known series of tests for honesty, trustworthiness, helpfulness, ambition and persistence (25, p. 2). These involved the first use of what was known as the guess who technique, in which children were given a number of brief word-pictures and were instructed to write under each the name of every classmate who might fit the description (25, p. 10). The low correlations between these tests only increased the skepticism about tests as measures of temperament that grew out of the earlier results by Wissler and Sharp.

During the period, from 1890 to 1925, although temperament was actually being dealt with, it was not known as such. In the next period, which can be called the period of the great classical methods, temperament was known for the first time and defined as it is today.

This period was dominated by the so-called projective methods such as the Rorschach, Wartegg, TAT, Szondi, and such major temperament questionnaires as the Woodworth Personal Data Sheet, the Bernreuter, the

MMPI and the Humm-Wadsworth (16, p. 343). The projective tests were generally not used with any degree of objectivity, and were mentioned only to indicate that they were a part of the history of testing during this period. The self-report techniques, generally called questionnaires or inventories, are examined in greater detail, because they have often been used objectively, and regarded as objective tests (23, p. 171). Also, the early part of Raymond B. Cattell's work with temperament assessment was with questionnaires. His Sixteen Personality Factor Questionnaire (16 PFQ) contributed much to the more recent OAPT.

Self-report techniques have a history dating back to the first use of a patient's reports of his symptoms for medical diagnosis. From these early personal interviews came the very popular inventories and questionnaires. Essentially, these instruments are standardized interviews which have attempted to reduce temperament to psychometric terms to meet the need for mass-processing methods capable of more speed and standardization than the clinical interviews permitted (15, p. 405).

This need became apparent during World War I when large numbers of recruits had to be given psychiatric screening to determine the mentally fit. Prior to this, such screening was done by psychiatric

interviewers, but there were not enough interviewers. R. S. Woodworth, with A. T. Poffenberger, decided to give every man an interview by asking him, through the use of printed materials, the same questions that the psychologists would have asked (23, p. 171).

These early questionnaires included the common symptoms associated with mental disorders, such as day dreaming and enuresis (15, p. 465). These were presented as lists of specific acts, feelings, and percepts which were presumed to have value in defining attributes of temperament. The format of these devices has been described in more detail earlier in this chapter.

Woodworth's inventory was regarded as useful in screening out the maladjusted soldiers in World War I, and after the war, there was widespread enthusiasm for using these instruments for other tasks. Many inventories were developed for measuring the individual in various settings by adapting the Woodworth items (15, p. 465). It is useful to examine a few links between the early Woodworth inventory and present-day inventories to see how their development contributed to objective personality testing.

The original emphasis upon general personal adjustment vs. maladjustment persisted, but there was a growing tendency toward multiple scoring and the

measurement of traits, some of which are not directly related to personal adjustment (23, p. 172).

The first step in this direction was the Colgate Mental Hygiene Test, Part B2, by Donald Laird. This test contained items concerning psychoneurotic tendencies and was developed to detect those persons who needed application of mental hygiene procedures (32, p. 128). Items were chosen which, by definition, were related to each trait. For example, "Do you worry . . . ?" would show neurotic tendency; "Do you lead . . . ?" would show dominance (32, p. 128).

Shortly afterward, the A-S Reaction Study, by G. W. and F. H. Allport, was developed to measure an assumed trait of ascendance-submission (1, p. 2). At the University of Chicago, Louis L. and Thelma G. Thurstone produced the Thurstone Personality Schedule. It was made-up of the Woodworth items plus many new ones, and was designed to detect students who needed psychiatric attention (46, p. 3).

Hugh Bell found that the Thurstone items could be grouped more logically according to adjustment in home life, in social life, and in personal health. From this assumption, he developed an inventory that was reported to give a more analytic measurement of personal adjustment (4, p. 2). He recognized that this would give a picture of the individual's degree of adjustment

as the person himself sees things. However, it has been found that the scores also agree with impressions of others who are in positions to observe these adjustments (37, p. 227).

The Bernreuter Personality Inventory, published in 1931, was constructed by pooling items from these earlier inventories. It was designed as a general purpose instrument to indicate degree of maladjustment as well as positions on all the traits measured by the inventories from which the items came. Separate scores were obtained for the traits; neurotic tendency, introversion vs. extroversion, dominance, and self-sufficiency (6, p. 387). It was unique in regarding behavior in a certain situation as symptomatic of several traits. Since an inventory item is a stimulus situation, the same item can be scored for more than one trait. His proposal was to let a limited number of items do the work of a much larger number by the economical device of giving each item scoring weights for more than one trait.

This theory didn't work, according to Guilford. As he put it: "although the multiple-scoring system is a great step toward economy of effort, it also tends to defeat one of the goals of multiple scoring. The unfortunate effect . . . is to bring about high intercorrelations among some of the scores" (23, p. 175).

For example, the Bernreuter scores N (neurotic tendency) and I (introversion) tend to correlate in the range of .90 to .95. Likewise, the score D (dominance) and N correlate about -.80 and the score D and I correlate about -.70 (23, p. 175). This indicates that both measure essentially the same psychological variable, therefore one score would do in place of two. These traits probably were not this highly correlated, but the coefficients of correlation were inflated because of similar scoring weights and the use of the same responses as the basis for two or more scores (23, p. 175). In spite of this criticism, the practice of multiple scoring of items is still commonly used in many tests, including the OAPT.

Because it appeared to offer a great amount of information about temperament, the Bernreuter was the first instrument to gain wide acceptance. In spite of its age, the Bernreuter is still one of the currently used inventories, and most testing in schools and industry of temperament is done with devices similar to it (2, p. 533).

Another well known inventory was the Humm-Wadsworth Temperament Scale. Its scoring concepts were based directly on pathological concepts, using the Rosanoff theory of personality. According to this theory, there were six temperament variables, or

components, found in normal persons and which stood out even more clearly in varieties of abnormals (29, p. 452). These varieties were mentioned here only briefly to illustrate that this inventory was backed by theory of a type. Thus it was the forerunner of later inventories with which this study was concerned. There has been some skepticism as to the justification of placing both normal and pathological groups along the same continuum on these traits, but this practice was generally accepted.

The Humm-Wadsworth differed from the earlier Bernreuter in at least two other respects. First, the response weights are validated against external criteria rather than the provisional scores from the same items, as in the Bernreuter. Also, a secondary score, known as the no-count score, was included. This score represented the first attempt to devise an indicator as to the probability of an examinee trying to look more, or less, normal than he actually is. For most items the yes response was the pathological one, so if an examinee marked an unusually large number of no responses, he was suspected of attempting to bias his score in the direction of normality. An unusually large number of yes responses was also suspected, because it may have indicated a person who tried to look less normal for some reason (23, p. 176). The authors of the Humm-Wadsworth recommend that test results with

extreme no-count scores not be interpreted at all, and the less extreme ones be adjusted. However, others have found that this practice did not seem to be very helpful (35, p. 525).

Another currently used inventory is the Minnesota Multiphasic Personality Inventory (MMPI), which is the most widely used inventory in clinical practice (23, p. 178). Like the Humm-Wadsworth, the MMPI took its scoring categories from pathological concepts, but it recognized a larger number of them. These scores, based on the Kraepelinian categories of personality, were not expected to represent pure traits. Rather than the one supplementary score indicating test-taking attitudes and the bias they exert on scores as in the Humm-Wadsworth, the MMPI had four such scores (26, p. 249). These scores were important to this review because they represented attempts to correct one of the weaknesses of the self-report techniques; their susceptibility to faking.

These were the most widely used inventories, yet their value in assessing personality in the so-called normal group was rather uncertain. Reliability was generally high, between .70 and .90 (23, p. 180), but validity was much lower. Some discrimination between the major categories of pathology have been reported, but for working with normals the results

have been generally unsatisfactory (36, p. 527). For predicting college grades there have been some small correlations, but generally, experienced psychologists have been unable to discriminate the profiles of passing students from those of failing students (27, p. 164).

Both the Humm-Wadsworth and the MMPI emphasized scores claiming empirical validity. The items were chosen because experimental trial showed that mental patients gave responses different from those of normal adults, and not because they fitted a definition of a trait. This procedure had been used by Woodworth to select his items, but generally not by subsequent inventories (15, p. 468). Recent inventories have contributed the use of improved definition of traits to objective temperament testing. Research in this area has been directed toward replacing the traits arbitrarily assumed by early investigators with traits representing genuine and significant aspects of temperament.

One approach to this was factor analysis. The origin of this technique has been mentioned earlier as it related to testing, but the first application of this technique to temperament measuring devices was Flanagan's factor analysis of the Bernreuter test (15, p. 467). It was found when factor analysis of temperament test responses were made, that the traits which emerged cut across the traditional classifications

of ascendance-submission, introversion-extroversion, and emotional adjustment. Often these titles were retained for their descriptive value of social and emotional aspects of behavior, but they did not lend themselves to unambiguous definition (8, p. 415). This trend was highly relevant to this review, because it formed the basis of the objective temperament tests. The work with factor analytic based inventories by Guilford and Cattell was discussed next because it led to the development of the OAPT.

First, the inventories devised by Guilford have been briefly mentioned. The main objective of these Guilford inventories was to provide scores for primary traits of temperament. He developed three main inventories; the Inventory of Factors STBOR, and Inventory of Factors GAMIN, and the Personnel Inventory. The basic assumption behind these was that they measured primary traits (27, p. 183).

Cattell was another psychologist who favored the use of factor analysis for deriving scoring variables. This has been the basis of both his earlier questionnaires and his more recent OAPT of the artificial-task type. He preferred the factor analytic method that he calls "multivariate experiment in the natural setting" (3, p. 218). He felt that this was an integration of the clinical and mathematical methods of defining traits,

enabling the psychologist to stay close to his data and gain information from both known and unknown clinical constructs (3, p. 218). This advantage was previously attributed only to the clinical methods.

He sought to improve the factor analytic investigation of basic traits by starting with a complete field of personality traits. He felt this was necessary because, as he stated: "true perspective in factor analysis of such a new realm as personality can only be obtained by beginning with an essentially complete trait-variable population--that representing the entire surface of the personality sphere" (14, p. 69).

Thus, he introduced the concept of personality sphere in an effort to arrive at a comprehensive description of personality. To include the entire personality sphere, the factor analysis was based on trait-variables, verbally defined. Cattell said this was necessary because: "the entire personality sphere is found only in the accumulated symbolism of language. This alone mirrors all facets of human nature important to man" (14, p. 69). He began, therefore, by assembling all personality trait names occurring in either the dictionary or in the psychiatric and psychological literature. This list was first reduced to 171 trait names by combining obvious synonyms; then the 171 trait names were used in obtaining behavior ratings

on a group of 100 adult subjects, made up of both sexes in a wide range of occupations. Each subject was rated by one associate who was well acquainted with him, as being above or below average. On the basis of the intercorrelations among these ratings, the traits were combined into 35 nuclear clusters (2, p. 539).

The next step in this condensation was also based on correlations. Ratings for 208 men by two independent raters were next obtained for each of the 35 clusters. A factor analysis of the intercorrelations among the 35 trait ratings led to a further reduction of the number of traits to twelve. These twelve traits were described by Cattell as the primary source traits of personality, but there was some question as to whether this implication of universality and stability was completely justified by the antecedent research (2, p. 540). These twelve primary factors were labeled alphabetically in his research from A through L. The trait names appear cumbersome and use relatively unfamiliar terms, as shown in Table 1 on page 37.

Cattell reported that these twelve traits have been corroborated by the findings of other investigators, using behavior ratings, questionnaires, and objective tests, and he has published much research to support this claim (2, p. 540). Still, it is possible that factors identified by the correlation of ratings may

Table 1
Primary Personality Factors

| Factor | Title |
|--------|---|
| A | Cyclothymia vs. Schizothymia |
| B | Intelligence, General Mental Capacity vs. Mental Defect |
| C | Emotionally Mature, Stable Character vs. Demoralized General Emotionality |
| D | Hypersensitive, Infatible Sthenic Emotionality vs. Phlegmatic Frustration Tolerance |
| E | Dominance vs. Submissiveness |
| F | Surgency vs. Melancholic, Cycloid Desurgency |
| G | Positive Character Integration vs. Immature, Dependent Character |
| H | Charitable, Adventurous Rhathymia vs. Obstructive, Withdrawn Schizathymia |
| I | Sensitive, Imaginative, Anxious Emotionality vs. Rigid, Tough Poise |
| J | Neurasthenia vs. Vigorous, Obsessional Determined Character |
| K | Trained, Socialized, Cultural Mind vs. Boorishness. |
| L | Surgent Cyclothymia vs. Paranoid Schizothymia |

reflect the influence of social stereotypes and other constant errors of judgment by the rater, rather than the behavioral organization of the subject.

Cattell's 16 PFQ was developed to measure the personality factors identified in his research. He reported identifying twenty distinct functional unities by factor analysis and incorporating sixteen which appeared to have the most clinical importance into this questionnaire. Among these sixteen traits were the twelve previously identified source traits, slightly redefined, and four others that were revealed only by the factor analysis of the questionnaires. The sixteen factors of this questionnaire were reported in Table 2 on page 39.

The 16 PFQ included items of two major types. The first involved questions about the individual's own behavior, or his opinions about others, with which he must agree or disagree. The second type involved making value judgments by choosing between alternative occupations, recreational activities, or types of persons (2, p. 541).

Also included in this inventory were a few verbal and numerical items, such as those often found in group intelligence tests. Two parallel forms of this questionnaire, each containing 187 items, are available and the use of both forms is suggested for greater

Table 2
Sixteen Personality Questionnaire Factors

| Factor | Title |
|--------|--|
| 1 | Cyclothymia vs. Schizothymia |
| 2 | General Intelligence vs. Mental Defect |
| 3 | Emotional Stability vs. General Neuroticism |
| 4 | Dominance vs. Submission |
| 5 | Surgency vs. Desurgency |
| 6 | Positive Character Integration vs. Immature Dependent Character |
| 7 | Adventurous Cyclothymia vs. Inherent With- drawn Schizothymia |
| 8 | Emotional Sensitivity vs. Tough Maturity |
| 9 | Paranoid Schizothymia vs. Trustful Accessibility |
| 10 | Bohemianism vs. Practical Concernedness |
| 11 | Sophistication vs. Rough Simplicity |
| 12 | Worrying Suspiciousness vs. Calm Trustfulness |
| 13 | Radicalism vs. Conservation |
| 14 | Independent Self-sufficiency vs. Lack of Resolution |
| 15 | Will Control and Character Stability |
| 16 | Nervous Tension |

reliability. Even so, the reliabilities of the trait scores only ranged from .50 to .88.

The previously mentioned inventories and questionnaires were characterized by several weaknesses. Guilford pointed out the grounds upon which they were most frequently criticized. He stressed that the subject doesn't know himself well enough to describe himself and that the examinee will fake his responses to give the appearance he desires (23, p. 194). To quote Stager's view of the inherent weaknesses of the self-report nature of these inventories: "One must be very cautious in using these self-report devices, because it can not always be assumed that a self-report of a given action is a valid indicator that a person has carried out or will carry out the action defined" (40, p. 64). Often the individual sees only a distorted picture of himself and describes that faulty concept.

Cattell reported that the OAPT did not share this weakness because its tests measured behavior in actual situations and not through self-assessment of an introspective nature (12, p. 2). It should be pointed out that Cattell does not include inventories and questionnaires among objective tests because their self-report nature leaves them vulnerable to faking.

Anastasia reported on the objective tests, and labeled them artificial-task and indirect tests. To

quote from her text:

"One of the most promising current trends in personality testing appears to be the development of a wide variety of simple and comparatively objective tests, most of which are of the paper-and-pencil type. . . these techniques can be characterized as relatively structured and disguised. Rather than attempting to utilize complex, lifelike, or realistic situations, these tests present the subject with an artificial task which bears little resemblance to the criterion to be predicted. The tests under consideration represent efforts to identify behavior which serves as a valid predictor of a criterion, without being a direct sample of criterion behavior" (2, p. 649).

She also brought out that the rationale underlying the construction of such tests was often based upon the concept of personality style (2, p. 649), as were Cattell's earlier measure of personality.

A few of the major test construction programs that are now in progress, concerned with this type of test, are the research projects of Thurstone at the University of North Carolina (46, p. 3), MacKinnon at the University of California (2, p. 650), and the study, which this thesis treats, by Cattell at the University of Illinois (10, p. 1). Although these researches are in the experimental stage, they have reached the point where they are ready for application outside the laboratory.

One of the main sources of these simple, objective tests has been the area of perceptual and cognitive functions. A great volume of literature has shown

significant relationships between performance on perceptual or cognitive tasks and the individual's attitudinal, motivational, and emotional characteristics (2, p. 613). Each of the three projects previously mentioned included perceptual tasks.

MacKinnon, for example, included a battery of fourteen perceptual and cognitive tasks which yielded a total of 52 scores. Among these were such learning and perceptual problems as the solution of insight puzzles, the judgment of weights, retinal rivalry, the perception of movement, and the recognition of geometrical figures imbedded in more complex designs (Gottschalldt Figures) and the identification of incomplete figures (Street Gestalt Test), (2, p. 650).

The tests developed by Thurstone also made use of many perceptual tasks. Some of these dealt with closure, or the completion of an incomplete figure. In others, conflicting perceptual cues induced stress in these perceptual problems. As an illustration, in one Thurstone test the names of colors were printed in colors different from the named colors, and the subject was instructed to name the colors and ignore the words (45, p. 15).

Test G2 entitled What Do You See? of the OAPT is essentially the same as those used by MacKinnon and Thurstone. In this test the subject must also identify

incomplete pictures with both the speed and accuracy of closure being measured. A description of the OAPT has been reserved for Chapter III of this thesis.

Another type of artificial-task personality test was based on partially controlled verbal associations. These tests were somewhat similar to free-association tests, except that the nature of the tasks assigned in the artificial-task tests was more restrictive.

Thurstone included two of these tests in his previously mentioned project. One of these was the Synonyms-Antonyms Test. In each of the two parts of the test, adjectives were exposed one at a time on a screen. In the first part, the subject was asked to give an antonym for each word. In the second part he gave a synonym. In each list, three types of adjectives were used; affectively positive, stating complimentary facts about people; affectively neutral, referring to such physical properties as shiny, damp, or legible; and affectively negative, describing uncomplimentary human qualities. Three scores were obtained. Thus, the subject's speed of response was compared on synonyms and antonyms, affectively toned and neutral stimuli, and complimentary and uncomplimentary adjectives.

Thurstone's Verbal Emphasis Test also dealt with verbal associations. It was reported to measure differences in the speed with which the subject made

cognitive and affective discriminations in the meaning of words. Sixty word pairs were presented and the subject stated which of the two words were stronger. Half of the pairs required cognitive discriminations, as in colossal--large. The other half were affective in nature and required discriminations between positively or negatively toned words. Interested vs. enthusiastic was considered positively toned; miserable vs. unhappy was negatively toned. Thus the median reaction time for cognitive and affective discriminations, and for positively and negatively toned words within the latter category, could be compared (2, p. 655).

II. Literature on Biographical Data

During the past quarter of a century, emphasis has been placed upon measuring college achievement in terms of academic grades (38, p. 41). In fact, by far the most popular combination of measures has been the use of entirely intellectual predictors and criteria values (18, p. 671). The next most frequently reported type of research combined intellectual and nonintellectual predictors with purely intellectual criteria (18, p. 671).

More recently, student personnel programs have indicated an awareness that the educational process had not only intellectual goals, but also social and emotional goals (38, p. 38). Bennett saw the role of campus activities as being uniquely related to the latter goal. She stated that, "the need to belong and have respected status among fellows depends upon opportunities to share experiences and ability to give and take" (5, p. 57). Campus activities therefore, provided a yardstick by which the relative status of each individual could be measured.

The historical preoccupation with intellectual characteristics has been given less emphasis in this study in favor of concentrating primarily upon non intellectual characteristics. The label non intellectual normally refers to a vast array of interests,

values, attitudes, temperament, and social background (38, p. 670). In the present study, the nonintellective characteristics examined were temperament test scores, as the predictors, and measures of participation in campus activities, as the criteria. A detailed description of these has been included in Chapter III.

Two studies have examined variation in temperament characteristics among college and high school students using temperament inventories. A study by Gough used the California Personality Inventory to compare high school and college students of both sexes on temperament traits. He concluded that the chief differences between these two groups of students were on scales indicating responsibility, tolerance, achievement potential in academic and intellectual realms, flexibility, and a composite of poise, sociability, sensitivity and extroversion. The college students scored .5 to 1.5 of a standard score higher on these scales (33, p. 245).

A study by Heist and Williams used the Omnibus Personality Inventory in making the same comparison as was made by Gough. This study revealed one dissimilarity when compared to the Gough study. Scores on a social introversion-extroversion scale were higher for college students, thus making them appear more introverted than the high school students. Other than

this difference, it appeared that both sets of results were in agreement. In the study by Heist and Williams, the college students were .3 to 1.5 of a standard score higher on scales indicating responsibility, social maturity, tolerance, and motivation by intellectual goals (33, p. 246).

Another approach used to study the personalities of students has been comparing student bodies of various colleges on these traits. In a second study by Heist and Williams, the entering students in two liberal arts colleges were examined by administering the ACE Psychological Examination. The student body with a higher mean score on this test indicated temperament scores higher in social sophistication, nonauthoritarian thinking, and interest in matters of a theoretical or abstract nature. This group was also lower in inhibition or emotional restraint (33, p. 247).

Another relevant consideration was the relationship of part-time work during the school term to participation in other areas of college life. The general conclusion of research in this area was that for many students, it was not a great handicap to be self-supporting in college (54, p. 11). This has been investigated primarily as it applied to academic achievement, and not as it would have a limiting

effect upon the time available for participation in campus activities. Neither 247 juniors, nor 202 seniors included in a study by Umstatted at the University of Minnesota appeared to have their grades lowered by working (48, p. 138). Segal also found that there was little relation between grades and work for 127 students (39, p. 13).

Extensive literature has been addressed to the question of why approximately one-half of the students entering United States colleges leave before advancing their education to the point of the undergraduate degree, but no adequate conclusion has been reached (43, p. 627). McNeeley of the United States Department of Education studied drop-outs among 15,535 students who entered 25 universities in 1931-32. These schools lost 62.1% of these students in the succeeding four years. However, 17% of these were transfers to other educational institutions, so the net loss to higher education as a whole was 45.2% (43, p. 630).

A similar study was accomplished more recently by Iffert concerning attrition among 12,667 students entering 149 institutions of higher learning in 1950. The results showed that approximately one-half of the entering students would leave college during the next four years, but that eventually 59% would graduate.

Iffert found that almost one-half of the total withdrawals occurred during the freshman year (43, p. 630).

Summerskill reviewed 35 different studies that cited attrition rates for hundreds of classes in a number of institutions from 1913 to the present. He found that the median values computed for the aggregate were: 50% drop-out in four years, and 37% graduate in four years. Variations within these 35 studies were great, ranging from 12% to 82% attritions in four years (43, p. 630). This compilation gave a picture of the rates of attrition over a period of several decades, and some indications as to reasons for this situation.

In these thirty-five studies a significant relation between attrition and college grades existed. In many of these cases, the student gave the reason for drop-out as being due to academic failure. Although many leave college before graduation due to poor grades, it is important to realize that many also leave for nonacademic reasons including psychological, sociological, or economic demands.

Results from several studies indicate that fraternity membership is not generally detrimental to graduation because students who were members or pledges of fraternities, or sororities had better persistence records and graduation rates in the institutions of first registration than did non-members (50, p. 848).

Similarly, a recent governmental survey showed that: "Neither the type of activity nor the amount of time devoted to extra-curricular activities during the first registration period is related to attendance in college" (43, p.645). Thus, the research evidence does not support the common notion that drop-outs are frequently caused by over-participation in extra-curricular activities.

The results of studies by Gable and Mercer confirm the conclusion that examining participation in campus activities is the most suitable measuring device for assessing the students attainment in social development. In addition, they show some positive correlation between academic success in college and participation in extra-curricular activities (20, p. 61).

The importance of extra-curricular activities seems to extend beyond the college campus to the business world entered by many students after graduation. Studies relating participation in extra-curricular activities to various criteria of success in business life after leaving college, encounter criterion of success problems but seem to illustrate that; to quote Bennett, "in every measure of success obtained, the graduates who had been active showed a definite superiority over the alumni who had not participated in college activities" (5, p. 58). Also, alumni who had

been rated high in vocational success by their classmates revealed a tendency while in college toward greater than average achievement and honors in scholarship, athletics, and in other extracurricular activities.

This idea was further supported by the outcome of an extensive research project conducted by the American Telephone and Telegraph Company. This study found that employees with records of substantial achievement in extracurricular activities were earning an average salary of 20% more than the entire group twenty-five years after graduation. In contrast, those with some achievement were earning 10% above the median salary of the group, and those with no achievement were earning 10% below the median salary (51, p. 22).

Although relatively little research has been published concerning the relationship between either scholarship or activities and achievement in later life, there has been enough evidence of the value of a well-rounded program to encourage continued study of all aspects of personality in college students.

CHAPTER III

DESIGN OF RESEARCH

This study involved a two and one-half year longitudinal study of male college students at the University of Omaha. Personality tests were administered during the first semester of the subjects' freshman year; then, during the last semester of their junior year, biographical data concerning their participation in the various areas of college life were gathered by means of structured interviews. The information obtained on these two occasions was correlated to determine the relation between the personality variables and the participation in the areas of college activity. This chapter deals in some detail with the design of this research; including the group studied, the test materials and methods used, and the biographical items and methods of obtaining them.

I. GROUP STUDIED

The group studied in this research consisted of twenty-six subjects. These subjects were selected from the first-year, male fraternity pledges at the University of Omaha during the 1958-1959 school year. Participation of pledges from three fraternities was enlisted through the cooperation of fraternity pledge

trainers.. Motivation to do well on these tests was provided by implying that the scores would be made available to active members of the fraternities and may influence their standing within these organizations. This was done in an attempt to simulate the stress and motivation existing in testing for vocational or educational screening.

The age of these subjects at the time of administering the tests ranged from a low of seventeen years of age, to a high of nineteen years of age. When this testing was followed two and one-half years later by the collection of biographical data, the range was, of course, from nineteen to twenty-two years of age.

Before the biographical information was gathered, ten of the original twenty-six subjects had dropped-out of college. These drop-outs could not be fairly compared with those subjects still remaining in college on their accomplishments in college life, because the length of time in which they had opportunity to participate in these activities was shorter. Accordingly, only the items in school vs. out of school and fraternity membership were scored for all twenty-six subjects.

II. TEST MATERIAL AND METHODS USED

For use in this study, eleven sample tests were selected from those contained in the OAPT. These tests were made available by Raymond B. Cattell for experimental research on the assumption that the development of norms and validity data would progress more rapidly (12, p. 1). The controversy between the projective personality test advocates and those psychologists who prefer more objective measures of personality presents an important backdrop for this study. Although a single study can contribute only slightly to resolving this controversy, the opportunity to work with an objective test battery was a challenging undertaking.

The paper and pencil tests for group administration selected from the OAPT formed a battery that took approximately two hours to administer. Under the conditions present in this study, this seemed to be the optimum length of the test battery.

Variables Measured. The tests selected, the Master Index (MI) numbers, and titles of the variables represented by the scores were summarized in Table 3 on page 55. The extreme left column of Table 3 gives the test number, which has been assigned by Cattell, prefaced by the letter G. This letter G denotes a

Table 3
Variables from Tests Used

| Test Number | MI Number | Variable Number | Name |
|-------------|-----------|-----------------|--|
| G-2 | MI 7 | 1 | Speed of Gestalt Closure |
| | MI 146 | 2 | Accuracy of Gestalt Closure |
| G-8 | MI 288 | 3 | Speed of Evaluative Judgments |
| | MI 133 | 4 | Criticalness of Judgment |
| G-9 | MI 38 | 5 | Ratio of Consonant vs. Dissonant Recall |
| | MI 67 | 6 | Extremity of Viewpoint |
| | MI 152 | 7 | Tendency to Agree |
| | MI 167 | 8 | Efficiency of Immediate Memory |
| | MI 125 | 9 | Ratio of Personal to Insti- tutional Values |
| | MI 327 | 10 | Logical Consistency of Attitudes |
| | MI 113 | 11 | Acceptance of Reality Principle Contact |
| G-10 | MI 31 | 12 | Fluctuation of Attitudes |
| | MI 34 | 13 | Maturity of Opinion |
| G-18 | MI 102 | 14 | Derision of Obvious Aphorisms |
| | MI 150b | 15 | Acceptance of Obvious Aphorisms |
| G-27 | MI 117 | 16 | Highbrow Tastes |
| G-37 | MI 246 | 17 | Respect for Authority |
| G-38 | MI 211 | 18 | Susceptibility to Annoyance |

(Table continued on next page)

Table 3 (continued)

| Test Number | MI Number | Variable Number | Name |
|-------------|-----------|-----------------|--|
| G-41 | MI 219 | 19 | Honesty in Admitting Common Fraillties |
| G-43 | MI 271 | 20 | Verbal Fluency |
| G-44b | MI 308 | 21 | Speed of Number Comparisons |

group test rather than an individually administered test (12, p. 12). The next column indicates the MI number of the personality test variables. This is a complete list of variables found by Cattell in his research, and the numbers were assigned as a means of identifying these variables in reference to that list. Such a definite identification device was needed because titles were sometimes altered in different publications. The name of the variable is at the extreme right in Table 3. This table also includes variable numbers, from one to twenty-one, which correspond to the numbers presented in Tables 5 and 6.

Test G-2, entitled What Do You See?, was reported to measure two variables related to Gestalt closure; Speed of Gestalt Closure, MI 7; and Accuracy of Gestalt Closure, MI 146 (12, p. 39). This visual Gestalt closure is the ability to get a synthesis out of a diffuse presentation, so that the whole becomes unified. Rather than seeing separate and unconnected parts of the picture, the subject perceives it as a whole. Frequently this unification occurs suddenly and this phenomenon is called closure. In test G-2 the subject was given a series of incomplete line drawings and an open-ended format was used requiring him to write down the name of the object drawn (30, p. 2). The subject had two and one-half minutes to identify twenty-four

drawings, so this test was considered moderately speeded.

Variable MI 7 from this test was concerned with the speed of Gestalt closure. It was scored by adding the number of answers given correctly in the period allowed for this test (39, p. 2). Cattell described a low score on this variable, that is, a small number of drawings correctly identified, as indicative of a "respect for reality, and for precision in dealing with reality . . . in such disciplined mental performance as reading, computing, and estimation of time while working" (12, p. 55). One scoring higher on this variable would be characterized by a greater degree of imaginative thinking and perception. This represents a penetrating restless individual who is critical of himself and others. This variable was reported to be most beneficial in predicting calm, realistic judgment by low scores (12, p. 55).

The other score derived from test G-2 was variable MI 146, Accuracy of Gestalt Closure. This score was equal to the number of items, identified correctly divided by the number of items attempted. When interpreting the score on the Accuracy of Gestalt Closure variable, a low score showed the same tendency of the individual towards the realism pole as was represented by a low Speed of Gestalt Closure score.

A high score on this variable was reported to show that the individual possess the self-uncertainty along with the self-assertion that Cattell said was significantly correlated with the Dominance score in the 16 PFO (12, p. 56).

The next test was G-8, Goodness of Work. Two scores were also derived from this test; MI 288, Speed of Evaluative Judgments, and MI 133, Criticalness of Judgment (12, p. 39). In each item the subject had to evaluate a human performance and the given response alternatives, A,B,C, and D, expressed various degrees of criticalness. This test was moderately timed in that the subject was allowed three minutes to complete twenty-five items (30, p. 4).

The first of these variables, MI 288, Speed of Evaluative Judgments, was scored as equal to the number of items checked. Thus, it was a measure of a tendency to rapidly evaluate the performance of others, without considering the criticalness of the evaluation. A high scores was reported to be linked with quick decisiveness, high fluency, high speed and efficiency in a variety of mental activities, ego strength and a high degree of persistence. Cattell noted that this was a variable from which to select by high scores executives, leaders and wherever a high power output was required for a given intelligence (12, p. 53).

The other variable scored in test G-8 was MI 133, Criticalness of Judgment. This variable was found by scoring the response very poor as three, the response poor as two, the response good as one, and the response very good as zero, adding these scores and dividing the total by the number of items done (12, p. 3). This variable measured criticalness in rating performance in common tasks. High scores indicated a tendency to set a high standard and consider activities of others poor when they fall short of this standard. Lower scores revealed a less critical nature. This has been reported to have a substantial negative correlation with training performance and scholastic performance. However, individuals high in this perform well and rapidly in the immediate social situation and respond positively to approval and negatively to disapproval. Cattell hypothesized that this variable must indicate a temperament that was critical and demanding of others in social contact (12, p. 56).

The next test, G-9, Personal Opinion Inventory I, supplied seven variables (12, p. 40). For practical purposes, this test has been designed to include several otherwise independent tests. The subject had to answer one hundred opinionaire-type items with a multiple choice format. On most items the response alternatives extended from strongly agree to strongly

disagree. The test was liberally timed (30, p. 2).

The first variable to be scored from test G-9 was MI 38, Ratio of Consonant vs. Dissonant Recall. This variable measured the frequency of recall for items which have elicited agreement (30, p. 2). Items included deal with ethics, morals, social traditions and social skills. "The highly endowed individual tends to agree with statements presented to him, to avoid cheating, to respect authority, to be honest in admitting his weaknesses, to be suggestible and to keep up a good performance despite shock or disapproval" (12, p. 53).

The second variable scored from test G-9 was MI 67, Extremity of Viewpoint. This was scored by counting the items in which agreement is checked by the subject, next counting the items in which he disagrees, and considering all other items as being in a neutral class (30, p. 2). The score was found by adding the items in which he agrees and disagrees and dividing the sum by the number of items in which he expresses neutrality. This variable used the same controversial items as the previous variable in deriving the score, but measured the inclination to rate these beliefs in strong terms. One scoring low in this Extremity of Viewpoint variable was supposed to possess a kind of realism of prudence and caniness. This was

said to go with steadiness of viewpoint and logical clarity. The high scorer tended towards impassiveness, unwillingness to rush or respond to pressure of suggestion, and absence of attitude fluctuation (12, p. 56).

The third score derived from test G-9 was variable MI 152, Tendency to Agree. This score was computed by simply dividing the items in which the subject agrees by the items in which he disagrees (30, p. 3). Higher scores on this Tendency to Agree variable indicated a predisposition to agree with opinions of others, rather than be noncommittal or in disagreement. This was reported to measure a pattern of suggestibility, good deal of interest in the self, some evasiveness of reality, and social gregariousness (12, p. 55).

The fourth variable scored from test G-9 was entitled, Efficiency of Immediate Memory, MI 167. This score involved items in which the subject consistently indicated his agreement, disagreement, or neutrality by marking them the same in all parts of the test; minus those in which he changed his opinion (30, p. 3). This represented attitude consistency which resisted social influences. Basically this was a memory test for verbal items with the emotional content of the items not considered.

MI 125, Ratio of Personal to Institutional Values, was the fifth variable to be derived from test G-9. It was determined by scoring items from this test which are associated with personal interest vs. the welfare of society in general or segments of society (30, p. 3). A high score on this variable indicated a high degree of interest in the self, which would motivate behavior for personal gain, and not for group benefit. Social welfare leanings were said to be present in one low in this score.

The sixth variable scored from test G-9 was MI 327, Logical Consistency of Attitudes. This was scored from twenty-three items in the form of syllogisms. The score was the number of syllogisms in which the two premises and the conclusion were correctly checked, divided by the total number of syllogisms (30, p. 4). This variable indicated clear, logical reasoning which was not easily swayed by desire for social expediency or tendency to agree with others.

The last score obtained from test G-9 was MI 113, Acceptance of Reality Principle Contact. The score was obtained from selected items concerning agreement with the idea of a practical approach and hard work to gain desired ends, rather than resorting to fantasy to achieve satisfaction (30, p. 3). The individuals scoring high in this variable had good

reality contact, and, in general, possessed well-intentioned, considerate regard for society (12, p. 53).

The next test was G-10, Personal Opinion Inventory II. This test contained the same one-hundred items used in test G-9. As was mentioned earlier, these were opinionaire-type items of the multiple choice format, with response alternatives extending from strongly agree to strongly disagree. The first twenty items were repeated unchanged, but each of the second twenty items is accompanied by additional arguments of opinion. The remaining sixty items contained suggestions in the sense that the subject was told the opinion of authorities, items forty-one through sixty; of successful people, items sixty-one through eighty; and of neurotics, items eighty-one through one-hundred. Thus several measures of attitude shift were scored (30, p. 3).

From test G-10, two scores were obtained. These were MI 31, Fluctuation of Attitudes, and MI 34, Maturity of Opinion (12, p. 40). The Fluctuation of Attitudes score was found by comparing the responses on the first twenty items of test G-9 to previously given responses for these same items. There could be a shift of up to four points on each item. The differences on these items were summed for the Fluctuation of Attitudes score (30, p. 2). This score revealed a tendency

to change attitudes without justification, not in response to social pressure or persuasion, but merely over a period of time.

Another variable scored from test G-10 was MI 34, Maturity of Opinion. This variable came from items twenty-one through forty of test G-10 and the corresponding items from test G-9. Once again there could be a shift of up to four points on each item. Shifts from the disagreement pole toward the agreement pole were scored positively; the shifts toward the opposite pole were scored negatively. The algebraic sum of these shifts gave the Maturity of Opinion score (30, p. 2). A high score indicated the shift in attitude from disagreement toward agreement poles in response to advice or additional relevant information.

Thus, it measured change in opinion when additional factual information was learned or simply willingness to be swayed by opinions of others.

Test G-13, Self-evident Statements dealt with the tendency to consider remarks as obvious. The subject had to respond twice to the same series of common statements. The first time he indicated all those which he considered trivial; the second time he expressed his agreement or disagreement with each on a four point scale. Both sections were moderately speeded; with a four-minute time limit for the first

forty items, and a three-minute time limit for the second forty items (30, p. 2).

In this test two variables were measured. One of these was MI 102, listed as Derision of Obvious Aphorisms by Cattell (12, p. 41). This variable was scored by taking the last checked statement and adding to its number half the number of items between it and the next to the last checked statement. This was the number completed. Then, the number checked was determined and divided by the number completed. A high score on this variable was reported to indicate a tendency to regard very common ideas as unimportant and foolish. In fact, they were considered so obvious that the person scoring high would have a low opinion of anyone using them in conversation. Low scores indicated tolerance for persons lower in intelligence and social sophistication.

The second variable scored from test G-18 was MI 150b, Acceptance of Obvious Aphorisms (12, p. 41). This variable was derived from the items of test G-18, by scoring zero for strongly disagree, one for disagree, two for agree, and three for strongly agree. The variable score was the sum of these divided by the number of items done (30, p. 3). High scores on this variable were reported to indicate caution, self-criticalness and even timidity.

The test G-27, Personal Tastes, was reported to be a measure of Highbrow Tastes, the variable numbered MI 117 in Cattell's system (12, p. 42). In this test the subject was presented with a series of items asking for his preference over a range of activities, such as reading, aesthetics, and decorating. He selected one of three alternative answers. Each alternative was weighted for what Cattell calls highbrowness. The timing was liberal with five minutes to complete the twenty items. (30, p. 3). A high score indicated preferences considered by society as more highly cultured. Scores were influenced by level of education and may be correlated with salesmanship and success in situations requiring social aggressiveness (12, p. 52).

The next test in this battery was G-34, Good and Bad Values. In this test, the subject expressed his agreement or disagreement with a set of items originally obtained from the Adorno F scale. This test was used to measure the variable MI 246, Respect for Authority (12, p. 42). A high score indicated a tendency to bow to the will of society and legally constituted authority. The low scoring individuals were considered to be in rebellion against these powers.

Another test included in this battery was G-38, Common Annoyances. In this test the individual rated a series of common annoyances as very annoying, somewhat

annoying, or not annoying. The annoyances concerned both things and people. This test was liberally timed, with three and one-half minutes for twenty-five items (30, p. 3), and was scored for the variable MI 211, Susceptibility to Annoyance (12, p. 43). This score was obtained by adding two points for each item marked very annoying, one point for each marked somewhat annoying, and zero points for each not annoying marked. The sum of these values was divided by the number of items checked in all (30, p. 3). High scores indicated a pattern of anxiety over relatively mild stimuli and hostile reaction to stress and annoyance. A person with a high score would become irritated by many routine situations in business and personal life.

Test C-41 dealt with Honesty in Admitting Common Frailties. In taking test C-41, the subject was instructed to indicate whether or not he has been guilty of certain common frailties, weaknesses, etc. These frailties were those common to most people. The test was liberally timed in that the subject had three minutes to finish the twenty items (30, p. 3). This test was said to be an excellent device for measuring honesty in confessing to socially unapproved behaviors, thoughts, feelings, and attitudes. Perhaps this was an indication of an ego strength that will permit such admission of weakness without a feeling of threat.

Also included in the test battery was test G-43, entitled Ideas for Writing. This test involved story completion, production of words beginning with a given letter, and a series of anagrams (30, p. 4). It was very strictly timed, with three minutes to do the twenty items. The score derived from this test was variable MI 271, Verbal Fluency (12, p. 43). In scoring this variable, the number of words beginning with x was multiplied by four, and these were added to the number of words produced in the story. This score was reported to give a good measurement of an individual's general energetic tendencies and his ability to make decisions and transmit them fluently in written communication by verbal symbols (30, p. 53).

The final test was the test of number comparison, G-44b, called Matching Numbers. There were four parts to this test. In parts one and four, the subject compared two columns of four-digit number combinations, i.e. one pair of numbers at a time, and checked them as being the same or different. In parts two and three, the comparison was between two columns of seven-digit numbers. The test was speeded with only forty-five seconds for each part. To obtain the score for variable MI 305, Speed of Number Comparisons, every item done was counted, regardless of whether it is right or wrong (30, p. 4). This is a task in which

speed of discrimination was a factor and was reported to assess a type of "energetic, fluent decisiveness" (12, p. 53).

Methods of Administration. The administration manual for this test battery was prepared by the Bureau of Industrial Testing and Institutional Research at the University of Omaha. This manual included sections giving precise directions and timing for each of the tests. The examiner read directly from this manual in administering these tests. In tests G-9, G-10, and G-43, the whole instruction was given by the administrator orally, whereas, in all other tests the directions were printed directly on the tests for the subject to read.

Apparatus required for the tests was limited to test booklets, pencils, a stopwatch, and the administration manual.

II. BIOGRAPHICAL DATA CATEGORIES AND METHODS USED

To determine the relation between the personality variables measured and participation in college life, college life was divided into five general activity areas. These were scholastic, athletic, social, leadership, and work activities. Biographical items were selected to measure the level of student participation in each of these areas. These biographical items,

the areas in which they indicated participation and their scoring has been summarized in Table 4. This table also includes variable numbers which correspond to the numbers used in Tables 5 and 6. These eleven items were the specific content objectives upon which the structured interviews, used in gathering this data, were focused. At the time of the collection of the biographical data, it was found that a number of the original subjects tested had withdrawn from school. From this, a drop-out variable was computed. Those individuals still in college were given a score of one for this item; those out of college, a score of zero.

Biographical Data Categories. In the scholastic area, persons having obtained a scholastic honor or special recognition for his academic achievement were given a score of one; those with no such distinction were given a score of zero. Scholastic honors obtained included being on the Honor Roll or Dean's List, and receiving scholastic awards or scholarships.

Participation in the area of athletics was broken down into two categories; intercollegiate varsity and intramural athletics. Participation in any organized athletic activity offered at Omaha University was counted. Students participating in one semester or more of varsity athletics were awarded one point; those with no varsity experience were given a score of

Table 4
Summary of Biographical Data Obtained

| Areas | Variable Number | Items | Explanation of Scoring |
|-------------|-----------------|--|--|
| Drop-out: | 22 | In school | 1-Still in college, 0-Out of college |
| Scholastic: | 23 | Scholastic honors | 1-Scholastic honors, 0-None |
| Athletic: | 24 | Sports-inter-collegiate varsity | 1-Participation, 0-No participation |
| | 25 | Sports-inter-mural | 1-Participation, 0-No participation |
| Social: | 26 | College-number of organization memberships | Total number of organizations belonged to |
| | 27 | Fraternity-membership | 1-Member 0-Non-member |
| Leadership: | 28 | College-number of offices held | Total number of offices held |
| | 29 | College-leadership score | Total value assigned to offices held |
| | 30 | Fraternity-number of offices held | Total number of offices held |
| | 31 | Fraternity-leadership score | Total value assigned to offices held |
| Work: | 32 | Part-time job | 1-Held part-time job, 0-No part-time job held |

zero. Likewise, students who participated in at least one semester of intramural activity received a score of one; and for those with no intramural athletic participation a zero was recorded.

In the area of college social life, fraternity membership and membership in other college organizations were treated separately. Fraternity members were given a score of one, and non-members received a score of zero. Since all were fraternity pledges at the time of testing, the non-member category included those who left the fraternity prior to being initiated. The number of organizations joined, other than fraternities, were counted for each individual and this number was recorded to give the number of organization memberships.

Leadership scores were also obtained both for fraternity and other college organizations. In both fraternity and non-fraternity organizations, the number of leadership positions held was recorded for each subject. Also in the area of leadership, scores were assigned to various offices to differentiate the degree of leadership involved in each office. The office of president of the organization was given the highest score of five; the office of vice-president was given the score of four; offices of secretary or treasurer, the score of three; all other offices were given a score of two; and membership in an organization with no offices

held rated a score of one.

The area of work on a part-time job during the school term was also included in this study. Those subjects who held a part-time job during the college term were given a score of one, those who did not hold part-time jobs received zero scores.

Method of Obtaining Biographical Data. The desired biographical information was obtained from each subject in a structured interview. Only factual, historical information was obtained; not opinions or attitudes. The structured interview was used rather than a questionnaire because it was felt that the personal contact offered by the interview would motivate the subjects to respond more freely. This motivation was of the two types described by Kahn and Cannel as; 1) "intrinsic", and 2) "conformance to social norms" (31, p. 45). Intrinsic motivation depended directly upon the personal relationship between interviewer and respondent. The respondent was motivated to communicate with another because he received gratification from the communication process and the personal relationship of which it is a part. The other type of motivation was to be found in the socially accepted virtues of treating a stranger courteously, answering when spoken to, and telling the truth(31, p. 45).

No extrinsic motivation was provided in these interviews, because the respondent could not gain anything or bring about any desired change by his responses. In the interview situations, where the demands were modest and potential threat at a minimum, the personal relationship between the interviewer and the respondent and the conformance to social norms by the respondent were deemed adequate to generate sufficient motivation to insure his cooperation throughout the interview.

The interviews were structured around the eleven specific objectives by the use of an interview schedule. The degree of structuring sought was such that good rapport was established by the spontaneity of the interview, yet the same items of biographical data were received from each subject.

The scheduling of the interviews was accomplished by contacting each of the individuals and arranging a time and place for the interview. To secure the cooperation and to avoid hostility that could bias responses, the interviews were scheduled at the subjects' convenience. Realizing that the reaction of the respondent is often in terms of feelings about the interviewer and the process of the interview, as well as in terms of the questions asked, the same degree of consideration for his feelings was practiced in the

actual interview situation (44, p. 28). The interviews were opened by explaining why the biographical information was desired and why they had been chosen to participate in the study. When the subject had been put at ease, the specific objectives of the interview were introduced.

CHAPTER IV

RESULTS AND DISCUSSION

The previous chapters dealt in detail with methods utilized in the acquisition of the raw scores for the personality variables and measures of participation in various college activities. Sixteen of the thirty-two field test measures were subjected to linear transformations before proceeding with the correlation analysis. These transformations were designed to permit more meaningful and accurate analysis by eliminating some of the more troublesome distribution characteristics, especially skewness.

I. RESULTS

The values in the body of Tables 5 on page 78 and 6 on page 79 were product-moment correlation coefficients derived from the previously described data. The number of bivariate observations employed in these computations (n) was determined by the number of subjects involved. Two correlation matrices resulted from the information included in this study; one twenty-three variable matrix based on twenty-six subjects, and one thirty-one variable matrix based on sixteen subjects. The variation in number of subjects for these matrices was due to the drop-out factor.

Table 5

Intercorrelations for Test Scores and Biographical Data

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | | |
|----|---|-------|------|------|------|------|-------|-------|------|------|------|------|------|------|------|------|--------|--------|--------|------|-------|-------|-------|--------|-------|--------|------|-------|-------|-------|------|-----|-----|
| 1 | | .82** | -.21 | .15 | .48 | -.38 | -.51* | .13 | -.35 | .17 | .01 | -.40 | -.18 | .29 | -.10 | .30 | -.19 | .05 | .14 | .00 | .14 | .09 | -.04 | .19 | -.26 | .05 | .21 | -.34 | .21 | .11 | .58* | | |
| 2 | | | -.15 | .20 | .43 | -.35 | .47 | .08 | -.40 | -.27 | -.15 | -.21 | -.43 | .05 | -.23 | .20 | -.24 | .14 | .14 | -.43 | -.23 | -.16 | .02 | .13 | -.33 | .30 | -.25 | -.39 | .27 | .23 | .39 | | |
| 3 | | | | -.02 | -.30 | .13 | .32 | -.50* | .27 | .05 | .01 | .17 | -.41 | .42 | .29 | -.28 | .01 | .11 | .22 | .01 | .12 | -.59* | .25 | -.23 | -.23 | -.33 | -.10 | .14 | -.09 | .02 | -.04 | | |
| 4 | | | | | .17 | -.34 | -.14 | .08 | .00 | -.17 | -.14 | .22 | -.36 | .29 | .15 | -.07 | -.64** | .15 | .06 | .33 | .19 | -.15 | -.50* | .20 | -.51* | -.35 | .26 | .00 | -.35 | -.39 | .25 | | |
| 5 | | | | | | -.07 | -.20 | .08 | -.20 | -.31 | .33 | -.08 | .00 | .06 | .12 | .24 | -.26 | .04 | -.11 | -.13 | -.05 | -.03 | .00 | -.19 | -.31 | .24 | -.14 | -.29 | .27 | .02 | .58* | | |
| 6 | | | | | | | -.16 | -.28 | .16 | -.38 | .42 | .26 | .21 | .12 | .34 | -.17 | .24 | .24 | -.36 | .11 | -.09 | -.18 | .43 | -.26 | .00 | -.12 | -.12 | -.01 | -.05 | -.15 | -.30 | | |
| 7 | | | | | | | | .00 | .53* | .27 | .05 | -.15 | -.14 | -.13 | -.06 | -.39 | .08 | -.02 | -.02 | -.13 | -.28 | -.06 | .12 | -.30 | .46 | .02 | .35 | .49 | -.27 | -.16 | -.15 | | |
| 8 | | | | | | | | | .10 | -.04 | .18 | -.17 | -.16 | -.17 | .03 | .28 | -.09 | -.02 | -.23 | -.04 | .21 | -.38 | .38 | .30 | .06 | .29 | .22 | .04 | .18 | .11 | .00 | | |
| 9 | | | | | | | | | | .22 | .45 | .07 | -.25 | -.10 | .38 | -.49 | .04 | -.13 | -.42 | .30 | -.09 | -.27 | .15 | -.26 | .31 | .09 | .43 | .55* | -.05 | -.03 | .18 | | |
| 10 | | | | | | | | | | | -.17 | .10 | .04 | -.11 | .15 | .15 | .07 | -.69** | .04 | .04 | .02 | .23 | -.27 | .40 | .36 | .29 | .42 | .46 | .43 | .57* | -.09 | | |
| 11 | | | | | | | | | | | | .15 | -.18 | .12 | .30 | -.25 | .13 | .39 | -.63** | .24 | -.07 | -.11 | .06 | -.28 | .05 | -.14 | -.21 | .10 | -.05 | -.07 | .07 | | |
| 12 | | | | | | | | | | | | | -.16 | .03 | .23 | -.28 | -.05 | .10 | -.22 | -.03 | -.07 | -.31 | -.15 | -.05 | -.22 | .00 | -.17 | -.21 | .16 | .15 | -.24 | | |
| 13 | | | | | | | | | | | | | | -.29 | .14 | .30 | -.35 | .22 | .29 | .24 | .33 | .04 | .03 | .13 | -.12 | -.17 | -.03 | -.12 | -.20 | .00 | | | |
| 14 | | | | | | | | | | | | | | | .47 | .22 | -.43 | .21 | .07 | .36 | .47 | .10 | -.15 | .19 | .02 | -.59* | .13 | .09 | -.12 | -.20 | .12 | | |
| 15 | | | | | | | | | | | | | | | | .20 | -.29 | -.30 | .01 | .30 | .42 | -.11 | -.17 | .20 | .15 | .02 | .45 | .49 | .36 | .24 | .23 | | |
| 16 | | | | | | | | | | | | | | | | | -.36 | -.41 | .12 | -.05 | .46 | .63** | -.31 | .50* | .23 | .16 | .22 | .13 | .48 | .41 | .14 | | |
| 17 | | | | | | | | | | | | | | | | | | .00 | -.07 | -.12 | -.17 | -.22 | .62** | -.46 | .02 | .13 | -.35 | -.23 | .09 | .16 | -.39 | | |
| 18 | | | | | | | | | | | | | | | | | | | -.19 | -.07 | -.27 | -.18 | .07 | -.34 | -.50* | -.32 | -.45 | -.55* | -.49 | -.51* | -.25 | | |
| 19 | | | | | | | | | | | | | | | | | | | | -.16 | .23 | -.11 | -.17 | .21 | .07 | -.06 | -.12 | .05 | -.03 | .01 | .14 | | |
| 20 | | | | | | | | | | | | | | | | | | | | | .63** | .16 | -.25 | .09 | -.10 | -.67** | .17 | .14 | .40 | -.47 | .22 | | |
| 21 | | | | | | | | | | | | | | | | | | | | | | .25 | -.31 | .21 | .18 | -.49 | .06 | .09 | .00 | -.07 | .27 | | |
| 23 | | | | | | | | | | | | | | | | | | | | | | | -.38 | .50* | .29 | .00 | .36 | .22 | .06 | .03 | -.09 | | |
| 24 | | | | | | | | | | | | | | | | | | | | | | | | -.76** | .21 | .07 | -.19 | -.02 | .01 | .04 | -.02 | | |
| 25 | | | | | | | | | | | | | | | | | | | | | | | | | .00 | .07 | .34 | .21 | .19 | .20 | -.10 | | |
| 26 | | | | | | | | | | | | | | | | | | | | | | | | | | .13 | .35 | .64* | .20 | .27 | .08 | | |
| 27 | | | | | | | | | | | | | | | | | | | | | | | | | | | .12 | .75** | .74** | .09 | | | |
| 28 | | | | | | | | | | | | | | | | | | | | | | | | | | | | .89** | .07 | .11 | .03 | | |
| 29 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | .07 | .14 | .08 | | |
| 30 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | .95** | .17 | | |
| 31 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | .02 | |
| 32 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | .02 |

* Significant at .05

** Significant at .01

Note.-- For variable names see Table 3 on pages 55 and 56 and Table 4 on page 72.

Table 6

Intercorrelations for Test Scores with Drop-out and Fraternity Membership

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 27 |
|----|---|-------|------|-----|-------|-------|------|------|-------|--------|-------|------|-------|------|------|------|------|-------|--------|-------|-------|-------|-------|
| 1 | | .82** | -.23 | .23 | .61** | -.44* | -.33 | .23 | -.19 | -.34 | -.18 | .02 | -.14 | -.11 | .16 | .00 | -.35 | .19 | .19 | -.12 | -.17 | .20 | .26 |
| 2 | | | -.25 | .23 | .62** | -.41* | -.27 | .08 | -.44* | -.54** | -.35 | .14 | .30 | .10 | .18 | -.09 | -.33 | .14 | .23 | -.41* | -.32 | -.25 | .08 |
| 3 | | | | .15 | .04 | .37 | .09 | .03 | .19 | .13 | .13 | -.26 | -.46* | .46* | .15 | .01 | .05 | .32 | .27 | .38 | .51** | .25 | .08 |
| 4 | | | | | .30 | -.05 | -.16 | .04 | .00 | -.14 | .02 | .03 | -.17 | .18 | .04 | -.12 | -.34 | .17 | .20 | .20 | .07 | .04 | .04 |
| 5 | | | | | | -.04 | -.22 | .28 | -.28 | -.53** | .08 | -.18 | -.13 | .12 | .37 | .00 | -.36 | .25 | .24 | .04 | .07 | .53** | .57** |
| 6 | | | | | | | -.35 | -.26 | .52** | .00 | .54** | .03 | -.01 | .17 | -.05 | .08 | .44* | .17 | -.43* | .43* | .42* | -.23 | -.25 |
| 7 | | | | | | | | .04 | -.25 | .14 | -.26 | -.05 | -.13 | -.11 | .16 | -.21 | -.05 | -.02 | .19 | -.38 | -.33 | .27 | .09 |
| 8 | | | | | | | | | -.13 | -.11 | -.02 | -.33 | -.21 | .00 | .20 | .21 | -.10 | .30 | -.10 | .08 | .19 | .39* | .39* |
| 9 | | | | | | | | | | .37 | .77** | -.13 | .01 | .11 | -.35 | .20 | .33 | -.22 | -.51** | .40* | .39* | -.41* | -.33 |
| 10 | | | | | | | | | | | .09 | -.23 | -.06 | -.02 | -.27 | .38 | .25 | -.40* | -.15 | .19 | .23 | -.27 | -.12 |
| 11 | | | | | | | | | | | | .00 | .04 | .28 | -.21 | .05 | .27 | .01 | -.56** | .34 | .21 | -.35 | -.17 |
| 12 | | | | | | | | | | | | | -.15 | -.17 | .20 | -.23 | -.03 | .00 | -.27 | -.20 | -.26 | -.29 | -.18 |
| 13 | | | | | | | | | | | | | | -.18 | -.24 | -.02 | .08 | -.44* | .21 | -.01 | -.10 | -.16 | -.16 |
| 14 | | | | | | | | | | | | | | | .27 | .22 | -.27 | .17 | .25 | .24 | .36 | .15 | -.21 |
| 15 | | | | | | | | | | | | | | | | -.11 | -.32 | -.01 | .28 | -.07 | .08 | .51** | .30 |
| 16 | | | | | | | | | | | | | | | | | .06 | .00 | -.14 | .03 | .44* | -.04 | -.11 |
| 17 | | | | | | | | | | | | | | | | | | .03 | -.33 | .18 | .27 | -.21 | -.13 |
| 18 | | | | | | | | | | | | | | | | | | | -.08 | .19 | .10 | .22 | .08 |
| 19 | | | | | | | | | | | | | | | | | | | | -.42* | -.05 | .56** | .40* |
| 20 | | | | | | | | | | | | | | | | | | | | | .70** | -.26 | -.35 |
| 21 | | | | | | | | | | | | | | | | | | | | | | .02 | -.32 |
| 22 | | | | | | | | | | | | | | | | | | | | | | | .55** |
| 27 | | | | | | | | | | | | | | | | | | | | | | | |

* Significant at .05
 ** Significant at .01

Note.-- For variable names see Table 3 on pages 55 and 56 and Table 4 on page 72.

This factor made accurate interpretation of the biographical information other than fraternity membership impossible for those leaving school prior to the acquisition of biographical information. Table 7 on page 81 reported the means and standard deviations for the thirty-one variables based on sixteen subjects. Table 8 on page 82 reported the same information for the twenty-three variables based on twenty-six subjects.

Analysis of the Thirty-one Variable Matrix. The matrix in Table 5 on page 78 was examined to determine relations among the activities in which the students participated, and to identify personality variables associated with participation in these activities. Seven of the 45 correlations between the college activity measures were significant at the .05 level. Certain artifacts may be contained in these findings. For example, the correlation between participation in intramural and intercollegiate athletics was probably negative because an individual engaging in an intercollegiate sport was barred from further participation in this sport as an intramural athlete. Nevertheless, an examination of the correlations between participation in various college activities produced some interesting findings.

The positive correlation of .50 between participation in intramural athletics and scholastic

Table 7
Means and Standard Deviations for Variables
Based on Sixteen Subjects

| Variable Number | Mean | Standard Deviation | Variable Number | Mean | Standard Deviation |
|-----------------|--------|--------------------|-----------------|--------|--------------------|
| 1 | 11.875 | 3.987 | 17 | .501 | .309 |
| 2 | .733 | .197 | 18 | 1.038 | .245 |
| 3 | 18.375 | 3.271 | 19 | .338 | .026 |
| 4 | .730 | .259 | 20 | 69.688 | 18.520 |
| 5 | 1.226 | .943 | 21 | 65.188 | 8.871 |
| 6 | 8.625 | 9.476 | 22 | .250 | .137 |
| 7 | 1.923 | .643 | 24 | .313 | .147 |
| 8 | 20.438 | 5.310 | 25 | .563 | .157 |
| 9 | .625 | .780 | 26 | 1.563 | 1.404 |
| 10 | .919 | .267 | 27 | .375 | .599 |
| 11 | 2.750 | 2.536 | 28 | 2.938 | 2.302 |
| 12 | 8.250 | 2.748 | 29 | .875 | .330 |
| 13 | 4.313 | 4.195 | 30 | 1.625 | .992 |
| 14 | .486 | .197 | 31 | 3.813 | 2.941 |
| 15 | 1.768 | .152 | 32 | .813 | .390 |
| 16 | 18.875 | 4.000 | | | |

Table 8

Means and Standard Deviations for Variables

Based on Twenty-six Subjects

| Variable Number | Mean | Standard Deviation | Variable Number | Mean | Standard Deviation |
|-----------------|--------|--------------------|-----------------|--------|--------------------|
| 1 | 11.154 | 1.459 | 13 | 4.384 | 4.074 |
| 2 | .691 | .074 | 14 | .463 | .058 |
| 3 | 17.544 | 1.292 | 15 | 1.696 | .164 |
| 4 | .723 | .085 | 16 | 19.734 | 2.220 |
| 5 | 1.021 | .938 | 17 | .555 | .303 |
| 6 | 11.322 | 19.209 | 18 | .984 | .240 |
| 7 | 1.793 | .607 | 19 | .312 | .082 |
| 8 | 18.038 | 6.572 | 20 | 74.538 | 23.979 |
| 9 | 1.125 | 1.539 | 21 | 64.423 | 11.576 |
| 10 | .974 | .918 | 22 | .631 | .486 |
| 11 | 3.692 | 3.135 | 27 | .538 | .499 |
| 12 | 9.153 | 3.768 | | | |

honors indicated that these two variables tended to be associated. Thus, the students obtaining scholastic honors were also likely to have engaged in athletics at the intramural level and vice versa. On the other hand, athletic endeavors at the intercollegiate level had low correlations with all of the other college activity measures.

The scores indicating campus organizations joined and leadership in these organizations were highly correlated with each other; and the same was true for fraternity membership and fraternity leadership. The correlation between fraternity and campus leadership, however, was lower than was expected. This indicated that campus leaders were drawn in about equal proportions from fraternity leaders and non-leaders.

Part-time work failed to show any significant correlation with the other college activities. This indicated that working part-time neither limited the number of other activities in which the students were involved nor denied them the opportunity to obtain scholastic recognition.

Perhaps these intercorrelations were most marked by their lack of statistical significance. Thus, except for the previously noted relations, there was little indication that the same individuals were to be

found in or out of a wide range of extracurricular activities.

Fifteen of the 210 correlations between personality characteristics and college activities were significant at the .05 level. Scholastic achievement was positively correlated with highbrow tastes; and negatively correlated with speed of evaluative judgment. The first correlation indicated that the scholastic achiever was prone to report preferences generally consistent with those considered highly cultured. According to Cattell such preferences probably reflect a need for achievement rather than general intelligence. The second correlation reflected the association of the winning of scholastic awards with a tendency to be cautious and somewhat indecisive in evaluating the performance of others.

Campus leadership and fraternity leadership correlated with the personality variables in sometimes comparable and sometimes contrasting ways. Campus leadership was closely related to two personality variables; susceptibility to annoyance and ratio of personal to institutional values. The negative character of the first relation meant that campus leaders were less susceptible to annoyance than non-leaders. The positive nature of the second association indicated a tendency for campus leaders to place personal welfare or the

achievement of individual goals ahead of institutional or social goals.

Fraternity leadership was associated with the susceptibility to annoyance in the same manner as campus leadership. Fraternity leadership was closely correlated with logical consistency of attitudes and campus leadership was correlated with consistency of attitudes in the same way. Both of the latter correlations indicated that those who eventually became fraternity or campus leaders were more consistent in their attitudes at the time of the testing than those who later failed to achieve leadership status.

A possible discrepancy between campus and fraternity leadership appeared in connection with the ratio of personal to institutional values. While campus leadership as noted previously correlated closely with this variable, fraternity leadership failed to correlate with the ratio of personal to institutional values.

Holding a part-time job while attending college appeared to be associated with speed of Gestalt closure and ratio of consonant to dissonant recall. While these correlations were statistically significant at the .05 level, it was still possible that other variables, such as financial considerations, were more closely associated with the holding of part-time jobs.

Further analysis of the data took the form of the computation of multiple correlation coefficients using the variables with the largest criterion correlations. Using participation in intercollegiate athletics as the criterion variable, a multiple correlation was computed based on three of Cattell's personality variables. The personality variables and their standard score regression weights were: respect for authority (.486), criticalness of judgment (-.319), and efficiency of immediate memory (-.162). The multiple correlation coefficient of .71 was slightly larger than the correlation between respect for authority and participation in intercollegiate athletics.

The campus leadership score was used as a criterion variable in computing another multiple correlation involving four of Cattell's personality variables. The personality variables and their standard score regression weights were: susceptibility to annoyance (-.421), tendency to agree (.407), acceptance of obvious aphorisms (.334), and ratio of personal to institutional values (.152). This combination resulted in a multiple correlation coefficient of .83.

The final multiple correlation coefficient involved fraternity offices as the criterion and personality variables logical consistency of attitudes

(.416) and susceptibility to annoyance (-.223) as predictors. This produced a multiple correlation of .59.

Cattell has identified several factors in the personality variables employed in this study. Four of these appeared to be related to participation in college activities in the sense that variables with the high loadings on the factors had consistently high correlations with certain of the activities.

Verbal fluency, speed of number comparisons, speed of evaluative judgments, and maturity of opinion measured Cattell's factor of energetic, fluent decisiveness. All of these variables had moderately high negative correlations with fraternity membership. The energetic, fluent decisiveness factor was described by Cattell as "associated with good immediate memory, fast judgment, high speed and effectiveness in a variety of mental performances" (12, p. 53). He also mentioned that it was not intelligence but was related to a high output by leaders and executives for a given intelligence.

Tendency to agree, and logical consistency of attitude tapped Cattell's social, emotional expediency factor and were positively correlated with the three campus organizational activity variables. These activity variables were number of college organization

memberships, number of college offices held and college organization leadership score. This factor was described by Cattell as a subtle pattern involving evasiveness of reality, some tendency to irritability, and an unsocial, expedient, personal ambition (12, p. 55).

Accuracy of Gestalt closure, ratio of consonant to dissonant recall, and susceptibility to annoyance involved a schizoid tenacity factor according to Cattell. All three of these personality variables had negative correlations with the three variables concerning campus organizational activity variables. The schizoid tenacity factor was described by Cattell as a composite of self-uncertainty and self-assertion along with ego weakness and tenacity of performance (12, p. 56).

Finally, criticalness of judgment, efficiency of immediate memory, and derision of obvious aphorisms, which involved the factor of sympathetic energy mobilization factor was stated to be associated with a temperament which gets wrought up easily, but also relaxes quickly. It also involves working rapidly and well in the company of others, but not working steadily alone (12, p. 56).

The relations found between these four factors and participation in college activities deserve further study. A battery of tests tailored to measure only these factors would permit a more complete examination

of their role in college life.

Analysis of the Twenty-three Variable Matrix.

Table 6 on page 79 presented the matrix of product-moment correlations based on all twenty-six subjects. The purpose of computing these correlations was to relate drop-out and fraternity membership to Cattell's personality variables.

Five of the twenty-one personality variables yielded correlations which were significant at the .05 level with remaining in college for the two and one-half year period included in this study. A multiple correlation was computed using these five variables as predictors and remaining in college as the criterion. The predictors and their standard score regression weights were: honesty in admitting common frailties (.506), efficiency of immediate memory (.352), ratio of consonant to dissonant recall (.238), acceptance of obvious aphorisms (.225), and ratio of personal to institutional values (.039). The multiple correlation between these variables and remaining in college was .80.

Further analysis of the variables associated with becoming an initiated fraternity member was not undertaken because of the correlation between drop-out and fraternity membership. When part correlations were computed to determine the relation between that part of

the fraternity membership score not correlated with drop-out and selected personality characteristics, the results were as follows: .33 for ratio of consonant to dissonant recall, .21 for efficiency of immediate memory, and .11 for honesty in admitting common frailties.

II. DISCUSSION

Chapter III contains a survey of relevant information concerning attrition in American colleges. This section related the findings of the present research to findings of past studies. Summerskill, in reviewing thirty-five studies concerning attrition during a period from 1913 to 1960, found that the median attrition rate for these studies was about 50% drop-out in a four year period. However, there was considerable range in this characteristic among the colleges included; from 12% to 84% of the entering students left school in a four year period after entering. McNeeley's survey of this problem revealed that 62.1% of the students in his sample left college in the same four year period. Iffert found that 50% left college during the four year period after entering, but that eventually 59% would graduate. He also found that about one-half of the total withdrawals occurred during the freshman year.

In this study, the attrition rate was found to be 38.4% during a two and one-half year period after entering college. Since the freshman year often serves as a screening device, this appeared to be essentially in agreement with previous findings. Possibly the fact that the students in this study were fraternity pledges would tend to make the number remaining in college greater than it would normally have been. As Vogt found in his study, students who were pledges or members of fraternities had better persistence records than did unaffiliated students.

Previous research has also been devoted to an examination of relations between types and amount of extracurricular activities and remaining in college. An examination of the available research revealed that no close relations have been found in this area. The findings in this study were again in agreement with these previous results.

Some research studies have considered the role of part-time work as it entered into the drop-out problem. Umstatted, in a study conducted at the University of Minnesota, found that grades were not lowered as a consequence of working while attending school. The general conclusion of his and other studies was that apparently there is little relation between working at least part-time during the school term and remaining in

college. The present study considered the participation of the working student in various campus activities; both as to number of activities and the nature of these activities. It was found that part-time work was not significantly related to participation in any of the surveyed activities.

CHAPTER V

SUMMARY

Eleven objective personality tests were administered to twenty-six entering students at the University of Omaha and the results were correlated with information concerning the involvement of these students in college activities during the following two and one-half years. The purpose of the study was to discover relations among the personality test scores and degree of participation in the activities surveyed.

The test battery selected for this analysis was the Objective-Analytic Personality Test (OAPT), developed by Raymond B. Cattell. These tests were selected because they were reported to be more objective in their approach to personality assessment than the self-report techniques. Twenty-one scores were derived from the eleven tests used.

Both the predictors and the criterion measures in this study were somewhat unique in that they were primarily non-intellectual. The criterion values were measures of degree of participation in the major types of college activities. Five broad areas of college activities--leadership, athletics, scholastic honors, social, and part-time jobs--yielded nine scores. In

addition, the attrition among the students was investigated.

Relations between the personality variables and measures of college achievement were identified by an examination of their intercorrelations. Product-moment correlation coefficients were computed for these interrelations, and the variables with the larger criterion correlations were subjected to multiple correlational analysis.

A thirty-one variable correlation matrix, based on sixteen subjects, depicted the relations among the activities in which the students participated and personality traits. Seven of the 45 correlations between college activity measures were significant at the .05 level. Several interesting findings were revealed. A positive correlation between participating in intramural athletics and scholastic honors indicated that these two variables tended to be associated, but participation in intercollegiate athletics had low correlations with all of the other activity measures. The scores indicating campus organizations joined and leadership in these organizations were highly correlated with each other; and the same was true for fraternity membership and fraternity leadership. The correlation between fraternity leadership and campus leadership, was lower than expected. Moreover, the scores for

fraternity and other organizational activities, and part-time work failed to correlate significantly with participation in other activities.

Perhaps the intercorrelations of the activity measures were most marked by their lack of statistical significance. Thus, except for the previously noted relations, there was little indication that the same individuals were to be found in or out of a wide range of extracurricular activities.

Fifteen of the 210 correlations between personality characteristics and college activities were significant at the .05 level. Scholastic achievement was positively correlated with highbrow tastes; and negatively correlated with speed of evaluative judgment. Campus leadership and fraternity leadership correlated with the personality variables in sometimes comparable and sometimes contrasting ways. Campus leadership was negatively correlated with susceptibility to annoyance and positively correlated with ratio of personal to institutional values. Fraternity leadership was associated with susceptibility to annoyance and logical consistency of attitudes in the same manner as campus leadership, yet it failed to correlate with the ratio of personal to institutional values. Holding a part-time job while attending college appeared to be associated with speed of Gestalt closure

and ratio of consonant to dissonant recall, but it was possible that other variables, such as financial need, were more closely related to holding part-time jobs.

The multiple correlation based on respect for authority, criticalness of judgment, and efficiency of immediate memory as predictors and intercollegiate athletics as the criterion was .71. The multiple correlation using tendency to agree, acceptance of obvious aphorisms, susceptibility to annoyance, and ratio of personal to institutional values as predictors and the campus leadership score as the criterion was .83. The final multiple correlation involving susceptibility to annoyance and logical consistency to attitudes as predictors and the fraternity leadership score as the criterion was .59.

Cattell identified several factors in the personality variables employed in this study. Four of these appeared to be related to participation in college activities in the sense that variables with high loadings on the factors had consistently high correlations with certain of the activities. The relations found between these four factors and participation in college activities deserve further study.

A twenty-three variable correlation matrix based on all twenty-six subjects related drop-out and fraternity membership to Cattell's personality

variables. A multiple correlation was computed using the five personality variables significantly correlated at the .05 level with remaining in college for the two-and one-half year period involved in this study. The predictors were honesty in admitting common frailties, efficiency of immediate memory, ratio of consonant to dissonant recall, acceptance of obvious aphorisms and ratio of personal to institutional values, and the coefficient was .80. Further analysis of the variables associated with becoming an initiated fraternity member was not undertaken because of the correlation between drop-out and fraternity membership.

BIBLIOGRAPHY

1. Allport, G.W., and F.H. Allport. The A-S Reaction Study. Boston: Houghton Mifflin, 1928.
2. Anastasi, Anne. Psychological Testing. New York: Macmillan, 1959.
3. Bass, Bernard M., and Irwin A. Berg (Ed.). Objective Approaches to Personality Assessment. Princeton, New Jersey: D. Van Nostrand Company, Inc., 1959.
4. Bell, Hugh McKee. The Theory and Practice of Personnel Counseling. Stanford, Calif.: Stanford University Press, 1939.
5. Bennett, Margaret E. College and Life. New York: McGraw Hill Book Co., Inc., 1952.
6. Bernreuter, R.G. Theory and Construction of the Personality Inventory, Journal of Social Psychology. 1933a, 4, 387-405.
7. Boring, Edwin G. A History of Experimental Psychology (2nd ed.). New York: Appleton-Century-Crofts, Inc., 1957.
8. Boring, Edwin G., Herbert S. Langfield, and Harry P. Weld (Ed.). Foundations of Psychology. New York: John Wiley and Sons, Inc., 1956.
9. Cattell, James M., and L. Farrand. Physical and Mental Measurements of the Students of Columbia University, Psychological Review, 1896, 3, 618-648.
10. Cattell, Raymond B. The Description and Measurement of Personality. New York: World Book Co., 1946.
11. Cattell, Raymond B. Foundations of Personality Measurement Theory in Multivariate Experiment, in Bass, Bernard M. and Irwin A. Berg (Ed.). Objective Approaches to Personality Assessment, Princeton N.J.: D. Van Nostrand Co., Inc., 1959.
12. Cattell, Raymond B., et.al. Handbook for the Objective-Analytic Personality Test Battery, Champaign, Ill.: Institute of Personality and Ability Testing, 1956.
13. Cattell, Raymond B. Personality and Motivation Structure and Measurement, Yonkers-on-Hudson, N.Y.: World Book Co., 1957.

14. Cattell, Raymond B. The Description of Personality: Principles and Findings in a Factor Analysis, American Journal of Psychology, 1945, 58, 69-90.
15. Cronbach, L.J. Essentials of Psychological Testing. New York: Macmillan, 1959.
16. David, Henry P., and J.C. Brengelmann (Ed.). Perspectives in Personality Research. New York: Springer Publishing Co., Inc., 1960.
17. Feigl, H. The Scientific Outlook: Naturalism and Humanism. in Feigl, H., and May Bradbeck (Ed.). Readings in the Philosophy of Science. New York: Appleton-Century-Crofts, 1953, 8-18.
18. Fishman, Joshua A. Some Social-psychological Theory for Selecting and Guiding College Students, in Sanford, Nevitt (Ed.). The American College. New York: John Wiley and Sons, Inc., 1962.
19. Freeman, Frank S. Theory and Practice of Psychological Testing (rev. Ed.). New York: Henry Holt and Co., 1955.
20. Gable, R.I. A Study of the Student Drop-out Problem at Miami University. Dissertation Abstracts, 1957, 17, 61.
21. Gagne, Robert M., and Edwin A. Fleishman. Psychology of Human Performance. New York: Holt, 1959.
22. Gough, H.G. Personality Characteristics of Successful Graduate Students: A Progress Note. Berkley, Calif.: University of California, 1951.
23. Guilford, J.P. Personality. New York: McGraw-Hill Book Co., 1959.
24. Harris, Daniel. The Relation to College Grades of Some Factors Other Than Intelligence, Archives of Psychology, 1931, 131, 9-10.
25. Hartshorne, H., and M.A. May. Studies in the Nature of Character: 1. Studies in Deceit. New York: Macmillan, 1928.
26. Hathaway, S.R., and J.C. McKinley. A Multiphasic Personality Schedule (Minnesota). 1. Construction of the Schedule, Journal of Psychology, 10, 249-254.

27. Hews, V.H. A Comparison of Successful and Unsuccessful Students in the Medical School at the University of Minnesota, Journal of Applied Psychology, 1956, 40, 164-168.
28. Holtzman, Wayne H. Objective Scoring of Projective Tests. in Bass, Bernard M., and Irwin A. Berg (Ed.). Objective Approaches to Personality Assessment, Princeton, N.J.: D. Van Nostrand Co., Inc., 1959.
29. Humm, D.G., and K.A. Humm. Humm-Wadsworth Scale Appraisals, Journal of Psychology, 1933, 27, 443-452.
30. Hundley, John D. personal communication, Laboratory of Personality Assessment and Group Behavior, University of Illinois, September 27, 1962.
31. Kahn, Robert L., and Charles F. Cannell. The Dynamics of Interviewing. New York: John Wiley and Sons, Inc., 1960.
32. Laird, D.A. Detecting Abnormal Behavior, Journal of Abnormal and Social Psychology, 20, 1925, 128-141.
33. McConnell, T.R., and Paul Heist. The Diverse College Student Population, in Sanford, Nevitt (Ed.). The American College. New York: John Wiley and Sons, Inc., 1962.
34. Marcuse, F.L. (Ed.). Areas of Psychology. New York: Harper and Brothers, 1954.
35. Meehl, P.E., and S.R. Hathaway. The K Factor as a Suppressor Variable in the Minnesota Multiphasic Personality Inventory, Journal of Applied Psychology, 1946, 30, 525-564.
36. Meehl, P.E. Profile Analysis of the Minnesota Multiphasic Personality Inventory in Differential Diagnosis, Journal of Applied Psychology, 1946, 30, 517-524.
37. Pederson, R.A. Validity of the Bell Adjustment Inventory When Applied to College Women, Journal of Psychology, 1940, 9, 227-236.
38. Sanford, Nevitt. Higher Education as a Field Study, in The American College. New York: John Wiley and Sons, Inc., 1962.

39. Segal, David and M.M. Proffit. Some Factors in the Adjustment of College Students. Washington D.C.: Government Printing Office, 1938.
40. Stagner, Ross. Psychology of Personality (3rd ed.). New York: McGraw-Hill, 1961.
41. Spearman, C. General Intelligence, Objectively Determined and Measured, American Journal of Psychology, 1904, 15, 201-293.
42. Stern, George G. Environments for Learning, in Sanford, Nevitt (Ed.). The American College. New York: John Wiley and Sons, Inc., 1962.
43. Summerskill, John. Drop-outs from College, in Sanford, Nevitt (Ed.). The American College. New York: John Wiley and Sons, Inc., 1962.
44. Survey Research Center. Manual for Interviewers. Ann Arbor: University of Michigan Press, 1955.
45. Thurstone, L.L. Experimental Test of Temperament, in Essays in Psychology: Dedicated to David Katz. Uppsala, Sweden: Almqvist and Wiksels, 1951.
46. Thurstone, L.L., and Thelma G. Thurstone. A Neurotic Inventory, Journal of Social Psychology, 1930, 1, 3-30.
47. Tiffin, Joseph and Ernest J. McCormick. Industrial Psychology. Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1958.
48. Umstatted, James G. Student Self-Support at the University of Minnesota. Minneapolis: University of Minnesota Press, 1932.
49. Vernon, Philip E. Personality Tests and Assessments. New York: Henry Holt and Co., 1953.
50. Vogt, P.E. Why Students Fail, Science and Society, 1929, 30, 847-848.
51. Walters, Roy W., and Douglas W. Bray. Today's Search for Tomorrows Leaders, Journal of College Placement, 9, 1963, 22.

52. Watson, Robert I. Historical Review of Objective Personality Testing, in Eass, Bernard M. and Irwin A. Berg (Ed.). Objective Approaches to Personality Assessment. Princeton, N.J.: D. Van Nostrand Co., Inc., 1959.
53. Whipple, G.M. Manual of Mental and Physical Tests. Baltimore: Warwick and York, 1910.
54. Wise, William M. They Come for the Best of Reasons; College Students Today. Washington D.C.: American Council on Education, 1958.