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TITLE THE RELATION OF PERSONALITY MALADJUSTMENTS OF 503 UNIVERSITY OF MICHIGAN STUDENTS TO THEIR OCCUPATIONAL INTERESTS

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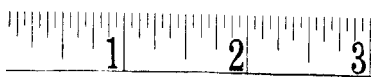

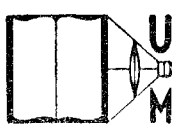

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1949

THE RELATION OF PERSONALITY MALADJUSTMENTS OF 503 UNIVERSITY OF MICHIGAN STUDENTS TO THEIR OCCUPATIONAL INTERESTS

by

Don B. Feather

A Dissertation Submitted in Partial Fulfillment
of the Requirements for the Degree of
Doctor of Philosophy in the
University of Michigan

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The writer would be remiss, indeed, if he failed to mention the helpfulness of Dr. Paul S. Dwyer, Professor of Mathematics and Consultant in the Statistical Research Laboratory, who advised him concerning the statistical procedures employed in this investigation.

Chapter I

DESCRIPTION OF THE STUDY

STATEMENT OF PROBLEM

That there is a definite relationship between a person's adjustment in general and his particular occupational interests has long been treated as an accepted fact. This paper will attempt to present additional evidence to substantiate the idea that there are positive relationships between personality adjustment and occupational interests.

ORIGIN OF THE PROBLEM

While working as a counselor in the Bureau of Psychological Services at the University of Michigan, it became apparent to the writer that there was some relationship between the personality adjustment problems of the counselees and their vocational preference patterns. When this was discussed not only with individual co-workers but in staff meetings as well, it became evident that others held the same idea. Permission was given for extensive exploration of the problem. To understand better the dynamics of the counselling situation, it was necessary to discover if a really significant relationship actually existed, or if such an assumption were merely an *a priori* postulate.

After observing numerous cases and discussing them with other workers in the Bureau, the writer began to tie down the problem by formulating his general impressions. A survey of the literature revealed that others had already explored various phases of it. We shall now consider some of these reports.

Darley.- In a preliminary study, Darley[1] reported that he empirically observed relationships between various types of tests in a testing battery. He pointed out that often these relations were merely "hunches" on the part of the social worker or counselor whereby he often judged a person to have potentially many of the characteristics required for various sorts of job competition, or that the counselors had "hunches" regarding an apparently elusive connection between the different kinds of tests. He stressed the idea that verification of any such clinical clues or "hunches" would constitute valuable additions to the counselor's fund of descriptions of cases, to the better understanding of the total clinical picture, and to the interpretations of the tests in question.

Sampling both men and women, Darley made a careful analysis of test scores statistically selected on the basis

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[1] John G. Darley, "A Preliminary Study of Relations between Attitude, Adjustment, and Vocational Interest Tests," Journal of Education Psychology, XXIX (September, 1938), 487-73.

of the relationships which had been subjectively observed in interview situations between vocational interests, and attitudes and adjustments as measured by the Strong Vocational Interest Blank, the Minnesota Scale for the Survey of Opinion, the Bell Adjustment Inventory, and the Minnesota Inventories of Social Attitudes. From this survey he drew "sketches" of personality-interest combinations. These really offered an interesting extension of occupational interest profiles into the area of personality characteristics that would seem to be developmentally determined and fixed prior to real occupational training. In conclusion, Darley said that his initial study merely suggested the future lines of needed research. He felt that a more intensive treatment of paired attitude and/or adjustment and interest test scores would permit the determination of any relationships that might exist for individuals as well as for general groups of individuals.

Bordin.- An interesting theory was proposed by Bordin.[1] He apparently assumed that the developing personality, during the process of growing up and attaining status, identifies himself with whatever occupational goals seem to hold promise of the greater satisfaction for his drives for mastery, ascendancy, social approval, and security. Bordin felt that

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[1] E. S. Bordin, "A Theory of Vocational Interests as Dynamic Phenomena," Educational and Psychological Measurement, XXIII (Fall, 1962), 641-55.

in answering a vocational interest test an individual expresses his own acceptance of a particular view or conception of himself in terms of occupational stereotypes. Following this line of reasoning it would seem that if the process of maintaining his personal adjustment an individual chose a new vocational goal he would presumably answer the interest tests differently to correspond to the changed concept of himself which he had acquired. Identification with symbols of status and anticipated values associated with occupational stereotype may afford satisfaction and therefore account for a given vocational choice. For instance, a person tends to choose a particular occupational goal because the activities associated with it meet his needs as he consciously or unconsciously feels them. Thus a person may decide to be a chemistry teacher because he likes to work with people and with scientific facts and apparatus, enjoys the respect and prestige afforded a teacher, and wants in some way to better humanity and improve the lot of the masses. That there is a connection between the person's adjustment and his occupational interest, Bordin admits, but whether his explanation is conclusive is a question still in need of more experimental evidence.

Tussing.- The possibility of using the Strong Vocational Interest Blank to measure personality traits was studied

by Tussing.[1] He ascertained that when certain items on the Strong Blank are weighted it gives a fairly good picture of some of the factors which make up a particular personality trait. This was found by determining how the items on the Strong test were related to the Allport-Vernon, Bell, and Bernreuter personality tests. Tussing tried also to find whether the Strong test could be used as a means of measuring the same personality traits as the above mentioned tests if the items on the Strong were weighted. In order to obtain these weightings, it was necessary to determine how the groups scoring at the extremes of the measures (high and low) varied in their responses on the Strong. Tussing studied the highest and lowest 25 percent. This method revealed that by using "weights" the Strong became a measuring device for some phases of personality. This study pointed out methods of approach to the problem of relating personality tests and interest inventories, but its conclusions were neither comprehensive nor detailed.

Sarbin and Berdie.- A still further comparison of relationships between values measured by the Strong and by the Allport-Vernon scale was demonstrated by Sarbin and Berdie.[2]

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[1] Lyle Tussing, "An Investigation of the Possibilities of Measuring Personality Traits with the Strong Vocational Interest Blank," Educational and Psychological Measurement, II (January, 1942), 59-74.

[2] T. R. Sarbin and Ralph Berdie, "Relation of Measured Interests to the Allport-Vernon Study of Values," Journal of Applied Psychology, XXIV (March, 1940), 287-96.

With a limited sampling they disclosed that a few of the occupational groups showing measured interest patterns are characterized by certain definite profiles on the Allport-Vernon scale. They found that groups of occupations could be easily differentiated by using the Allport-Vernon Scale.

Tyler.- However, when Tyler[1] correlated the Strong test and the Minnesota Personality test scores for fifty-five students in his psychological laboratory, he found that scores indicating neurotic tendencies showed no appreciable relationship to any kind of interest scores. But in this case it must be kept in mind that the number of cases was extremely small and that Tyler used the old Minnesota test which has since been replaced by the Multiphasic.

BASIC ASSUMPTIONS

Before the present writer could plan specifically, certain assumptions had to be made relative to the general problem. These are presented as follows:

First assumption.- There is a determinable relationship between a person's personality adjustment and his occupational interests.

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[1] L. E. Tyler, "Relationships Between S. V. I. Scores and Other Attitude and Personality Factors," Journal of Applied Psychology, XXIX (February, 1945), 58-67.

This implies that information pertaining to identifiable types of personality adjustment on the one hand, and to occupational interests on the other, could be found. Originally it was undecided whether to make personality adjustment or occupational interests the basic point of reference. It was felt that either, or perhaps both, of the approaches would be possible and useful. If the former were adopted, it would be necessary first to divide the cases into two general populations, namely, a "normal" and a "maladjusted" group, with the former affording the necessary control. Then the occupational interests of these respective arrays of cases could be discriminatingly studied. If however, the latter were employed, the foregoing procedure would be reversed; that is, general areas of occupational interests would first be established and then the extent to which normal or maladjusted individuals had indicated these respective interests could be determined.

Second assumption.- A higher percentage of maladjusted individuals choose the Social Service, Artistic, Literary and Musical areas on the Kuder Inventory than choose any of the other areas on that test. This assumption was purely empirical. Of the individuals who sought counseling at the Bureau, seemingly those with personality problems were more frequently classified in one or more of the foregoing areas than in any others.

Third assumption.- A higher percentage of maladjusted individuals than would normally be expected have significantly high scores on the Social Service area of the Kuder. A tentative explanation for this is that this area affords to college students a natural, intellectual solution to their "felt needs," a searching for "answers" to recognized problems. This implies that an individual recognizes some difficulty, seeks a solution in the field of social service or some related activity, and in so doing becomes identified with the field in question.

Another possible explanation for the foregoing assumption is that a large percent of maladjusted individuals are identified with the Social Service area because they have either conscious or unconscious guilt-feelings, and by turning to some form of social service they compensate by "doing good" - a kind of penance.

Fourth assumption.- A higher percentage of maladjusted individuals than would normally be expected have significantly high scores on one or more of the three "cultural" areas on the Kuder, i.e. Artistic, Musical, Literary. At the Bureau of Psychological Services it was often noted that students who were identified with these areas often were maladjusted, or potentially so. Indeed, it was consequently observed that unless a person "balanced" his interest in these areas with an interest in some contrasting area, or areas, the probability was that he was experiencing deep-seated difficulties of some sort.

IMPORTANCE OF THE PROBLEM

The question arose whether the investigation of such a subject was worthwhile. After due consideration the writer decided that the following reasons established the importance of the proposed study.

Since the very beginning of civilization, man has attempted to catalog individuals according to physical or personality traits.[1] Over the years many questions have evolved from the attempt to do so. For example, the question has long existed whether people get into a certain occupation as a result of their particular personality synthesis or whether the personality synthesis is largely a result of being in a certain occupation. When one is helping others to choose an occupational goal, it would be advantageous to have access to substantiated evidence on such an enigma. A clear answer to the total question is problematic and this study can not hope to solve the problem, but it can attempt to test the hypothesis that there is a relationship between one's personality and his occupational interests. The cause-effect relationship will have to be determined by subsequent investigations.

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[1] Goldie Ruth Kaback, Vocational Personalities. New York: Teachers College, Columbia University, 1946. Pp X + 114.

A second value of this particular project is that it will help predict the probability that maladjusted persons will apply for admittance to certain fields of study, that they will be found in large universities in these various areas, and that some of them will be seriously abnormal. Professional divisions, such as music schools, law schools, and teachers colleges represent such fields of interest and therefore should anticipate this problem.

In counseling situations it is essential that the counselor know both the stability of the counselee and the demands various occupations may make upon him. Ford[1] has pointed out that in some cases the mildly abnormal mental peculiarities are important determinants either in the choosing of a general life work or a specific occupation. Emotional instability may be considered related to the environment to the extent that when a person exhibits a tendency toward emotional abnormality, some general environmental shock may bring it out. It is probable that some occupations will throw an individual into more dangerous maladaptations than will others. If this research could shed any light on

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[1] Albert Ford, A Scientific Approach to Labor Problems. New York: McGraw-Hill Book Co. Inc., 1931. Pp X + 446.

this assumption it might suggest means for avoiding such a possibility. But be this as it may, the present data should furnish information concerning the pattern of personality adjustment of individuals who manifest the occupational interests classified by Kuder under specific occupational titles. The determination of the effect of a particular job on a given type of individual lies outside this project. The writer wishes to point out its importance for future research.

Hathaway and McKinley have indicated that "... if environmental pressure is small or if other personality factors are favorable a person may score over 70, the threshold of abnormality on the Multiphasic and yet escape need for special attention".[1] A competent counselor should be aware of this but at the same time allow for it when helping a person make long-range plans. True, in a college situation such cases may escape difficulty and even detection but have violent adjustment problems to face in post-college life.

Vocational counselors, psychologists, and laymen have long conceived of personality stereotypes which are typical of specific occupations. The business man, the scientist, the social worker, and the teacher are all said to

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[1] Starke R. Hathaway and J. Charnley McKinley, Manual for the Minnesota Multiphasic Personality Inventory. New York: The Psychological Corporation, 1943, p.9.

exhibit characteristics which differentiate them from one another and from people in general: they are considered "types." Traxler[1] tested this idea, and found it to be true, but also found that there were such wide differences within occupational groups that it was hard to generalize. If, however, we accept the notion that there are "types," we need to discover the personality characteristics of these "types" as well as their occupational classifications.

To reassure oneself of the need for such research as this, one needs merely recall Darley's statement,...

> no counselor will deny the need for knowing more about the vocational interest patterns or interest type truly characteristic of the students with whom he deals. He is justifiably suspicious of the specific occupational titles or labels in which the student claims to be interested. These claims too often grow out of superficial factors of prestige, assumed income levels, family pressures, romanticism, inadequate occupational information, over-ambition, or "white collar fixations."[2]

The more meaning that can be attached to occupational and test battery profiles, the surer the counselor can be that he is doing his job to the best of his ability.

METHODS OF STUDY EMPLOYED AND THEIR LIMITATIONS

After extensive exploration of the literature covering pencil and paper tests dealing with both personality

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[1] T. R. Sarbin and Ralph Berdie, "Relation of Measured Interests to the Allport-Vernon Study of Values," Journal of Applied Psychology, XXIV (March, 1940), 287-96.

[2] John G. Darley, Clinical Aspects of Interpretation of the Strong Test. New York: The Psychological Corporation, 1941, p. 72.

adjustment evaluation and occupational interests, and after a series of conferences with authorities in the fields of clinical psychology, social work, counseling, education, and industry, the writer decided to approach the problem by using five hundred consecutive case reports - 503 as it later developed - filed in the Bureau of Psychological Services at the University of Michigan in February and March, 1947. All of these reports were for college or prospective college students at the University. This particular group was chosen because, as previously stated, the writer was a counselor in the Bureau at the time, and the proposed project was officially approved and access to the necessary information was accordingly given.

However, owing to the setting of the problem, there were certain unalterable limitations. For instance, the measuring instruments were chosen as a matter of policy by the Bureau and no flexibility was allowed; that is, no major changes could be made in the already comprehensive test battery. At the time that this project was begun the Minnesota Multiphasic Personality Inventory and the Kuder Preference Record were being administered to all counselees. Within their limitations, however, (these limitations will be discussed in Chapter II which deals with these tests),

these two tests did provide a measurement of personality maladjustment and vocational preference patterns - the two factors necessary for the projected study.

The aforementioned 503 consecutive cases coming routinely through the Bureau of Psychological Services were chosen because they had taken the complete battery of tests including the Minnesota Multiphasic Personality Inventory and the Kuder Preference Record. A few were thus automatically excluded from this study because they had been referred as special cases for only part of the battery of tests for consultation purposes. A description of the 503 cases is given in Chapter III.

Following the administration of the Multiphasic and the Kuder, the tests were scored and the results together with the number of each case, the type of the case, and the sex of the individual were punched on International Business Machine Cards. From these the necessary tabulations were made.

STATISTICAL PROCEDURE

The following statistical procedure was adopted:

First step.- On the basis of criteria provided by the Multiphasic test the 503 cases were divided into "normal" and "maladjusted" groups. A score of 70 was employed for this purpose since "... abnormal subjects score above 70 on one or

more of the present scales. The majority of clearly abnormal persons score above 70 on two or more scales."[1] In this manner three hundred cases were selected for the normal group, and 203 for the abnormal. A detailed description of these groups is also given in Chapter III.

Second step.- The following tabulations were made for both the normal and maladjusted groups:

1. Type of case
2. Sex of individual
3. Number of areas significantly high on the Multiphasic
4. Number of cases significantly high on the Multiphasic by specific diagnostic groups
5. Number of cases significantly high on the Kuder by specific occupational groups
6. Same as number 5, but for all the combinations of occupational groups used in the Kuder manual
7. Number of cases significantly high on the Kuder
8. Number of cases significantly low on the Kuder by specific occupational groups
9. All scores on the various scales of the Multiphasic for each of the occupational groups of the Kuder.

Third step.- So that the significance of the differences of percents might be determined, all raw number counts were converted into percents. These percents were percents of the total of which any given unit was a part: i.e., "counts" within the normal group were converted into percents of the three hundred normal cases, and in similar manner those within

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[1] Starke R. Hathaway, J. Charnley McKinley, Manual for the Minnesota Multiphasic Personality Inventory. New York: The Psychological Corporation, 1943, p.9.

the maladjusted group were converted into percents of the 203 maladjusted cases. To determine the significance of the difference between the percents of the normal group and the percents of the maladjusted group in any one category the following formula was applied:

Modified Fisher t Formula[1]

$$t = \frac{p_1 - p_2}{\sqrt{PQ\left(\frac{N_1 + N_2}{N_1 - N_2}\right)}}$$

WHERE: $N_1 = 300$ (number of normal cases)

$N_2 = 203$ (number of maladjusted cases)

$$p_1 = \frac{X_1}{N_1} \qquad P = \frac{X_1 - X_2}{N_1 - N_2}$$

$$p_2 = \frac{X_2}{N_2} \qquad Q = 1 - P$$

X_1 = Specific number in category from N_1 group

X_2 = Specific number in category from N_2 group

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[1] This formula and procedure were adapted from Fisher* and Kenny,** under the guidance of Dr. Paul S. Dwyer, Professor of Mathematics and Consultant in the Statistical Laboratory at the University of Michigan.

* Ronald A. Fisher, The Design of Experiments. Edinburg, London: Oliver and Boyd, 1942. Pp XI + 236.

* Ronald A. Fisher, Statistical Methods for Research Workers. Edinburg, London: Oliver and Boyd, 1925. Pp IX + 239.

** John F. Kenny, Mathematics of Statistics. New York: D. Van Nostrand Company, 1939. Pp X + 202.

In discussing the application of the t technique, Fisher points out that it is customary to determine the interval within which any hypothesis might be considered tenable, and outside of which it might be considered untenable. This interval is called a "confidence interval" and the limits defining it are called "fiducial limits." Statements of probability made in terms of these fiducial limits are referred to as statements of "fiducial probability." He states that absolute values of t of 1.96, or greater, by chance will occur 5 percent of the time, and values of t of 2.58, or greater, will similarly occur 1 percent of the time.[1] Thus when a t score of 1.96 is obtained the hypothesis which it is testing is rejected at the 5 percent level of confidence. In a similar manner a t score of 2.58 leads to a rejection at the 1 percent level of confidence.

Since the procedure so represented is basic to the task at hand, the foregoing formula and its interpretation will be used consistently throughout this report.

In tabulating the data for the maladjusted group, for reasons explained at length on page , it was found advisable to maintain three separate divisions; namely, the general array of all 203 maladjusted cases which, in turn, were broken down

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[1] Ronald A. Fisher, The Design of Experiments. Edinburg, London: Oliver and Boyd, 1942. Pp XI + 190.

into aggregates of 107 and 96 respectively for study as occasion required. This necessitated three separate calculations throughout the study, but in instances where the numbers of percents became too small to be significant they were not presented in the final analyses to prevent floundering in a labyrinth of meaningless numbers.

CHAPTER II

EVALUATIONS OF THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY AND THE KUDER PREFERENCE RECORD

As already stated, this project has utilized two tests which the writer will now briefly describe; namely, the Minnesota Multiphasic Personality Inventory, and the Kuder Preference Record.

As far back as 1925, Laird[1] reported the need for a reliable, objective, and valid method of spotting persons in need of mental hygiene, and the need for an instrument which would give a fairly precise quantitative measurement of the degree and kind of deviation a person might exhibit. He proceeded to work along the lines of Woodworth's Psychoneurotic Inventory which was already in use. He made the assumption that all the traits which are characteristic of mental ill-health are but exaggerations of traits of behavior present in all human beings.

THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

Much experimenting has been done since the time of Laird and many personality tests have had wide, if temporary,

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[1] D. A. Laird, "Detection of Abnormal Behavior," Journal of Abnormal Psychology, XX (February, 1925), 128-41.

acclaim. At present, the Minnesota Multiphasic is attracting much attention in clinics and hospitals. It is a psychometric instrument designed ultimately to provide a test of all the more important phases of personality. Among the great number of personality inventories which have been published, it is now quite generally known that there are few which are of any practical value in a clinical situation. There are several reasons for this, some of which are quite apparent. For instance, one of the most important failings of most of the structured personality tests is their susceptibility to "faking" in one way or another. Furthermore, they are even more conducive to unconscious self-deception and role-playing on the part of individuals who may be consciously quite honest and sincere in their responses. One of the assumed advantages of the various projective methods is that they are relatively less influenced by these distorting factors, although this assumption should be critically evaluated.[1]

The Minnesota Multiphasic Personality Inventory has taken as its point of view in determining the importance of a trait as a criterion of personality the same basis as that of the clinical psychologist or personnel worker who tries to assay the traits that are often characteristic of disabling

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[1] Paul E. Meehl and Starke R. Hathaway, "The K Factor as a Suppressor Variable in the Minnesota Multiphasic Personality Inventory," Journal of Applied Psychology, XXX (October, 1946), 525.

psychological abnormality. The test is composed of some five hundred statements, each written in simple language, which cover a wide range of subject matter. The individual responds to each statement by checking one of the expressions: "True," "False," or "Cannot Say." From thirty to ninety minutes are required to administer the test. Very little instruction and no supervision are necessary.

When the test was constructed the items were arbitrarily classified under the following twenty-six headings:[1]

1. General health, 9 items
2. General neurologic, 19 items
3. Cranial nerves, 11 items
4. Motility and coordination, 6 items
5. Sensibility, 5 items
6. Vasomotor, trophic, speech, secretory, 10 items
7. Cardiorespiratory system, 5 items
8. Gastrointestinal system, 11 items
9. Genitourinary system, 5 items
10. Habits, 19 items
11. Family and marital, 26 items
12. Occupational, 18 items
13. Educational, 12 items
14. Sexual attitudes, 16 items
15. Religious attitudes, 19 items
16. Political attitudes - law and order, 46 items
17. Social attitudes, 72 items
18. Affect, depressive, 32 items
19. Affect, manic, 24 items
20. Obsessive and compulsive states, 15 items
21. Delusions, hallucinations, illusions, ideas of reference, 31 items
22. Phobias, 29 items
23. Sadistic, masochistic trends, 7 items

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[1] Starke R. Hathaway and J. Charnley McKinley, Minnesota Multiphasic Personality Inventory, New York: The Psychological Corporation, 1943, p.2.

24. Morale, 33 items
25. Items primarily related to masculinity, femininity, 55 items
26. Items to indicate whether the individual is trying to place himself in an improbably acceptable light, 15 items.

To be of greater value to medical and psychiatric clinicians, the Multiphasic Personality Inventory includes more varied subject matter so as to obtain a wider sampling of behavior of significance to the psychiatrist rather than separate sets of items for special purposes.[1] Special care was exercised to employ simple wording and a simpler method of presentation than is usually the case so as to stay within the comprehension of individuals on the lower intellectual and cultural levels. To guarantee a greater diversity of valid personality descriptions than was then available a large array of items was originally collected from which the various scales were finally constructed.

To identify items characteristic of a given psychoneurotic or other psychiatric type of personality deviation, it was necessary to contrast them with data secured from a group of "normal" individuals. For the normal group the

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[1] J. Charnley McKinley and Starke R. Hathaway, "The Multiphasic Personality Schedule (Minnesota): I. Construction of the Schedule," Journal of Psychology, X (April, 1940), 249.

authors of the test used individuals who came to visit patients at the University of Minnesota Hospital and who stated that they were not under a physician's care and who considered themselves to be in good health. About seven hundred such individuals were used. In addition the scores for some two hundred students entering college, and about two hundred WPA workers were collected. To get the data for clinical groups, the various items were administered to all cooperative neuropsychiatric in-patients in the same hospital.

To understand better the method Hathaway and McKinley used to develop their various scales, one can study how they developed the hypochondriasis scale. On the basis of clinical observation they carefully selected a group of fifty hypochondriacal patients. The Multiphasic scores of the normal group were then compared with those of the foregoing fifty patients. Concerning this procedure Hathaway and McKinley[1] have this to say:

> The location of an item having significance in differentiating hypochondriasis from normality is a simple statistical matter. If 5 percent of normal persons declare, for instance, that they commonly suffer with discomfort in the pit of the stomach, whereas 80 percent of the hypochondriacal group make the same declaration, then there is an item tending to characterize hypochondriasis. In itself the item might have several other possible significances, but 60 or 70 similarily

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[1] J. Charnley McKinley, and Starke R. Hathaway, "The Identification and Measurement of the Psychoneuroses in Medical Practice," Journal of the American Medical Association, CXXII (May, 1943), 161-167.

differential items identify a pattern of responses which characterizes the hypochondriacal person. Such a group of experimentally descriminative items may be spoken of as a hypochondriacal scale, since the degree to which an individual may be similar to definite clinical hypochondriacs can be determined by merely counting the items which the person answers indentically with the hypochondriacal group of patients.

At the present time well tested scales for hypochondriasis, depression, psychopathic deviation, psychoasthenia, and hypomania are published. Tentative, or preliminary, scales are also available for hysteria, masculinity-femininity interest, and schizophrenia. Several other scales are merely awaiting sufficient clinical material to permit validation. For the scales now published, corrections have been calculated for age and sex. The scores are expressed as standard scores, and the authors have arbitrarily used 50 to represent the average score for a group of normal persons. By means of the standard scale, one can directly compare the scores for the various characteristics and then enter them together on a single profile chart. Any score above 70 but below 80 is between two and three standard deviations above the average score for normal individuals and indicates a probable abnormality. At present, scores lower than the normal average appear to have no particular significance.[1]

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[1] J. Carnley McKinley, and Starke R. Hathaway, "The Identification and Measurement of the Psychoneuroses in Medical Practice," Journal of the American Medical Association, CXXII (May, 1943), 161-67.

Three tests are provided to indicate in a given instance, whether the questions have been carefully answered; namely, the "Question score," the "Lie score," and the "Validity score." The "Question score" is a validating score consisting of the responses, "Cannot say." The size of the score affects the significance of the other scores. Large "Question" scores invalidate all others. The "Lie score" affords a measure of the degree to which the individual may have attempted to change his scores by choosing the answers that placed him in the most acceptable social light. A high "Lie score" does not entirely invalidate the other scores but indicates that the true scores are probably higher than those actually obtained. The "Validity score" merely indicates the inability of the individual to comprehend the items or his carelessness in scoring. Recently a new key ("K") has been added to the test which is relatively successful in detecting the influence of attitudes disturbing to test-taking. It can be used to improve the discrimination between normals and abnormals.[1]

The Minnesota Multiphasic Personality Inventory, as a clinical aid, applies not alone to the cases obviously needing neuropsychiatric consultation, but also to any

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[1] Paul E. Meehl, and Starke R. Hathaway, "The K Factor as a Suppressor Variable in the Minnesota Multiphasic Personality Inventory," Journal of Applied Psychology, XXX (October, 1946), 525-64.

clinical situation in which the detection of psychic factors could play a part in diagnosis and/or therapy. A negative or normal profile reassures the clinician that there are no major psychological factors disturbing the subject. An abnormal profile indicates that there are definite psychiatric implications. The authors say:

> There is no intention of minimizing the imperfection of the particular device. From the outset, we have recognized that this whole approach might be inadequate. The results have gratifyingly vindicated the method and promise fruitful future development...
> Nevertheless, making cautious allowance for present imperfections, the validity of the scales is surprising. One should hardly expect to assay an individual's personality accurately and completely in a single behavior test session of an hour or two. It does not seem likely that an individual's personality could be more simply and quickly surveyed than could his physical system, - a complete physical evaluation being hardly possible in several times the test period employed for the Inventory.[1]

THE KUDER PREFERENCE RECORD

The Kuder Preference Record is a device to measure an individual's occupational preferences. Approximately five hundred items are grouped on a triad basis and the individual has an opportunity to compare each choice with two alternative choices. The results are reported in terms of percentile scores in nine general areas, namely, Mechanical,

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[1] Burtrum C. Schiele, A. B. Baker, Starke R. Hathaway, "The Minnesota Multiphasic Personality Inventory," Lancet, LXIII (September, 1945), 292-99.

Computational, Scientific, Persuasive, Artistic, Literary, Musical, Social Service, and Clerical. Kuder describes the general purpose of the test in the following words: "By means of the scores obtained, the individual's attention may be directed toward occupational areas which appear to be particularly promising in the light of his preferences. In many cases a person's attention may be called to an occupation for which he is suited but which he had not previously considered simply because of unfamiliarity."[1] Two specific uses of the Preference Record, according to Kuder,[2] are: "To point out vocations with which the student may not be familiar but which involve activities of the type for which he has expressed preference," and "To check on whether a person's choice of an occupation is consistent with the type of thing he ordinarily prefers to do." A third use is suggested; namely, employee counseling, but this is not yet clearly defined and has been attacked several times by persons who attempted to use it for that purpose, particularly for improving the placement of an employee and thereby enhancing his satisfaction and efficiency by putting him in the type of position that he would enjoy most. Relative to this matter Kuder states, "My personal view is that both tasks and aims are

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[1] G. Frederic Kuder, Revised Manual for the Kuder Preference Record. Chicago: Science Research Associates, 1946, p.3.

[2] Loc. cit.

important determiners in the selection of an occupation and in the satisfaction derived from it, and the relative importance placed upon them by different people varies greatly."[1]

In reply to a criticism of the Record by Bordin, Kuder[2] explained:

> The rationale behind the development of the scales was concerned, for purposes of efficient measurement, with the construction of relatively independent scales. It is my conviction that we must follow this principle of developing and using tests which overlap very little if we are ever to achieve a "master" battery of tests which can be used efficiently for predicting probable success in a wide range of occupations...
>
> As to the statistical foundation of the test; it is apparent that a vast amount of statistical analysis was necessary in building the scales in accordance with the rationale mentioned. The development of the two forms published was based on a statistical analysis, including item analyses of seven experimental forms which were successively administered and revised over a period of seven years. Analysis of the last experimental form alone involved obtaining 4,860 measures of relationships between items and scores. Results obtained from various occupational groups have also been obtained and reported in the manuals, and additional data are being collected systematically...

This clear statement of purpose and method by the author of the Kuder Record helps to evaluate it as a clinical instrument.

It would seem that the Record may be used with greater assurance in guidance than in selection. In the former case, it is assumed that the subject is eager to discover for himself

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[1] C. M. Barry, "Kuder Preference Record Norms," Occupations, XX (May, 1944), 487.

[2] G. Frederic Kuder, "Note on 'Classification of Items in Interest Inventories,'" Occupations, XXII (May, 1944), 484-7.

what his fundamental vocational interest patterns are. In selection, however, it is conceivable that he might be influenced to exhibit the kind of interests be believes are wanted. Patterson reported an experiment in this particular pattern in the December, 1946, issue of Occupations. He found that in the case of a particular individual who wanted to get a personnel-psychologist's job it was shown how susceptible particular interest inventories are to the kind of influence at work when a subject is an eager applicant for a given job. Both the Kuder and Strong tests were administered and gave some information, but in a selection situation it would seem that the Strong was preferable because it is more subtle and the vocational significance of liking or disliking each item in the array of four hundred items is not so readily apparent to the person taking the test.[1]

Some research has been done in regard to the different age levels for which the Kuder Preference Record is practical. Christensen[2] has made a study of this particular problem based on the vocabulary used in the test. He made a check list of twenty-one key words in the Kuder Preference Record. He found that the average occurrence of these words

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[1] D. G. Paterson, "Vocational Interest Inventories in Selection," Occupations, XXV (December, 1946), p.152.

[2] T. E. Christensen, "Some Observations with Respect to the Kuder Preference Record," Journal of Education Research, XL (October, 1946), pp 46-98.

is only three per million. This particular finding suggests that many high school pupils will probably have difficulty understanding the items which include these words. An objective test of meanings which a selected group gave to certain items included in the Preference Record demonstrated that many of the members of the group had erroneous ideas concerning them. Further data obtained by systematic instruction in the meaning of all the items found in the Kuder test indicated that instruction probably played a role in causing the subjects to change their preferences. In another instance when preference or non-preference for each item on the Kuder was determined solely by chance, it was found possible to secure high scores by such a procedure. When high scores are made they are frequently interpreted as being significant. Accordingly it might seem that using the Kuder Record on any subject who has not completed at least the major part of a high school course is inadvisable.

Several authorities suggest that a clinical approach should be used in interpreting the scores on the Kuder. There is a suspicion that the pattern of total scores accepted and rejected determines the occupational group with which the individual is identified by this instrument. Some people have no scores high enough on any scale to meet the clinical minimum scores suggested in the manual for the Record.

Further evidence is needed on the interpretation of intra-personal as well as inter-personal scores. Darley's concept of primary, secondary, and tertiary interest patterns might well be adapted to the Kuder Preference Record even though this pattern was primarily prepared for the Strong Test.[1]

With reference to validity, it is said,

> Mean profiles for the occupational groups studied to date are given ... the results indicate in general that the names assigned to the various scales are appropriate in terms of type of occupation entered as well as in terms of activities for which the scale is scored ... the reliabilities obtained for the preference record scales from various groups are listed.[2]

In a critique of the Kuder Preference Record, Hahn[3] points out that if one accepts the standards set by Fryer and Strong, the number of cases reported in the manual falls far below the minimum of two hundred fifty and the recommended five hundred. One of the limitations of the use of the tentative norms in the manual is the absence of a measure of dispersion, such as the standard error or probable error.

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[1] D. Fryer, Measurement of Interests. New York: Henry Holt & Co., 1931. Pp xxxvi + 488.

[2] G. Frederic Kuder, Revised Manual for the Kuder Preference Record. Chicago: Science Research Associates, 1946, p.9.

[3] E. Hahn, "Notes on the Kuder Preference Record," Occupations, XXIII (May, 1945), 467.

The norms for high school students in general have been developed. It has been found that there is little difference between the various classes. Woody[1] has substantiated the validity of high school norms as reported in the intermediate manual for the Preference Record.

Bordin[2] suggests that one abandon the hypothesis that interests are relatively stable motives and that a correlation between interests and learning achievements or curriculum satisfaction would be expected. Rather than this he suggests that the developing personality in the process of growing up and obtaining status, identifies itself with whatever occupational goal seems to promise most satisfaction: mastery, ascendancy, social approval and/or security. He writes,"... in answering a Strong Vocational Interest Blank, an individual is expressing his acceptance of a particular view or concept of himself in terms of occupational stereotype."[3]

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[1] Clifford Woody, "Aptitudes, Achievement and Interests of High School Pupils." Ann Arbor, Michigan: Bureau of Educational Reference and Research, University of Michigan, 1945, Bulletin No. 157, P VI p. 159.

[2] E. S. Bordin, "Theory of Vocational Interests as Dynamic Phenomena," Educational and Psychological Measurement, XXIII (December, 1932), 641-655.

[3] Ibid., p. 644.

If in the process of maintaining adjustment a new vocational goal is chosen, interest inventories would presumably be answered differently to correspond to the changed conception of himself which the person has acquired. According to this view, the specific activities of a chosen curriculum or vocation are not expected to be instrinsically interesting or motivating: it is the identification with the symbols of status and the anticipated values associated with the occupational stereotype which affords the satisfaction and accounts for the vocational choice.

The profiles of families of occupations and/or of professional training groups are the functional basis of much educational and vocational counseling at the present time. As more areas of behavior fall within the scope of measurement, additional group differences may be found to exist. The concept of the "worker-in-his-work-unit" may come to include not only a balance between interest, opportunities, and abilities but also between aptitudes and adjustment.

For experimental purposes, Frandsen[1] made seven correlation studies: 1. Strong Blank and the person's chosen occupation. 2. The Kuder Inventory and the self ratings of interests. 3. The Kuder Inventory and retest on the Kuder.

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[1] A. Frandsen, "Appraisal of Interests in Guidance," Journal of Educational Research, XXXIX (January, 1945), 1-12.

4. The Strong Blank and college marks. 5. The Kuder Inventory and college marks. 6. Special interest and corresponding achievements. 7. Intercorrelation of the following tests: Cleeton, Garretson, Gentry, Kuder, Lesur, Strong, and Thurston. His conclusions showed that something about a person is measured quite reliably by interest inventories. The inventory scores have been found to be inter-consistent and also consistent with other expressions of vocational choice, with self-ratings and achievements. But the significance of what is measured has been found to be much less clear. Interest inventories were shown to correlate negligibly with achievement and aptitudes, and possibly with curriculum satisfaction. In all the correlations the Kuder appeared the most satisfactory and favorable.

To enable the reader to understand better the two instruments used in this study, the foregoing description has been given. Now to clarify still further the position these tests hold in the field of testing, the following information is presented.

SURVEY OF SELECTED CURRENT LITERATURE

The evaluative literature on the two tests used in this study is largely restricted to magazines, monographs, and unpublished dissertations because of the relative newness

of the instruments in question. A brief survey of some of the more relevant studies concerning the Multiphasic and the Kuder may help clarify the purpose and limitations of these tools as revealed in current research and usage.

THE MULTIPHASIC

Ellis. - In an exhaustive analysis of nearly all of the published literature dealing with the validity of personality questionnaires, Ellis[1] points out that in spite of the many bad features of paper and pencil personality tests certain favorable things can be said about them. These may be summarized as follows:

1. Personality tests can be treated in an objective fashion and can be standardized.

2. They are usually easy to administer and score.

3. Statistical analysis shows that the traits evaluated by questionnaires have a real existence and do not result from chance factors.

4. They nearly always have a degree of validity, since even when an individual says that he does things (or likes things) which really he does or does not, the fact that he does state that he acts in such a way is important for an understanding of his personality.

5. Even if the total scores occasionally may be meaningless, an examination of particular responses by a trained clinician may provide valuable data.

6. The majority of investigations show that normal and abnormal persons do not differ with respect to their interpretations of questions in the test.

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[1] Albert Ellis, "The Validity of Personality Questionnaires," Psychology Bulletin, XLIII (September, 1946), 385-440.

7. As personality tests become more widely used and more statistically refined they may shed much light on the understanding of human nature.

8. It does not matter particularly if a subject answers a test untruthfully since, by and large, allowances for such a possibility are made in the standardization and /or scoring of most tests.

9. The test may be used as a formalized interview and may thereby give valuable personality information.

Gouch.- In this study Gouch[1] obviously concluded that relatively skilled persons are unable to simulate either a psychoneurotic or psychotic condition on the Multiphasic in such a way as to avoid detection. For this research he used a group of psychiatrists, clinical psychologists, psychiatric social workers, and personnel consultants. That these professional people were unable to sort out the non-pathological validating items, Gouch felt, added further evidence to the previously reported findings of other writers that the Multiphasic emphasizes the importance of subtle items included within the diagnostic scoring keys for validating purposes. The discovery and use of these subtle items resulted from the rigorously controlled experimentation employed in the validation of the scoring keys by Hathaway and McKinley.

Gouch also reported[2] that the Multiphasic, when given

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[1] Harrison G. Gouch, "Simulated Patterns on the M. M. P. I.," Journal of Abnormal Psychology, XLII (March, 1947), 215-25.

[2] Harrison G. Gouch, "Diagnostic Patterns on the M. M. P. I.," Journal of Clinical Psychology, II (January, 1946), 23-37.

to 136 neuro-psychiatric army cases, distinguished between normals and cases having mild psychoneurosis, moderate psychoneurosis, psychopathic personality, severe neurosis, and psychosis. The diagnosis of psychotics was not as accurate, however, as was that of neurotic groups.

Verniaud.- According to this writer, samplings of clerical workers, department store saleswomen and female optical workers showed characteristic differences in their responses to the Multiphasic.[1] These differences are strong enough to indicate that occupational differences in personality may be measurable and significant. Verniaud says, "One conclusion can be drawn from this investigation: there are group differences in the personality of successful workers corresponding to gross differences in job requirements, and some of these differences may be identified by responses on the M. M. P. I."[2]

Schmidt.- In his capacity as psychologist in the army, Schmidt studied[3] the value of the Multiphasic as a predictive instrument and clinical tool by comparing scores on the Multiphasic with clinical diagnoses of 121 cases in an Army Air Force replacement pool. He found, in general, that

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[1] W. Maud Verniaud, "Occupational Differences on the M. M. P. I.," Journal of Applied Psychology, XXX (December, 1946), 604-13.

[2] Verniaud, loc. cit.

[3] H. O. Schmidt, "Test Profiles as a Diagnostic Aid. The M. M. P. I.," Journal of Applied Psychology, XXIX (April, 1945), 115-31.

the Multiphasic:

1. Distinguished graphically and with statistical significance between normal soldiers and those diagnosed as constitutional psychopaths, mild or severe neurosis, and psychosis.

2. Differentiated with significance between major clinical groups.

3. Presented qualitative differentials, or hints for clinical query, in the more disintegrated or anomalous personality disorders.

The data are in agreement with Leverenz'[1] observation that although the clinical impression may not be corroborated always by the scores, the clinician is made aware of one or more personality abnormalities that require evaluation.

Harman and Wiener.- In the Vocational Rehabilitation and Education Division of the Veteran's Administration in Minneapolis, Minnesota, Harman and Wieman[2] found that the Multiphasic, as part of a test battery used in vocational diagnosis of disabled veterans applying for rehabilitation was of prime importance.

Based on their experience with the Multiphasic, the writers said:[3]

The M. M. P. I. serves to delineate personality characteristics of crucial importance in the actual choice of vocation, and it yields valuable information to aid in prognosis of success in training. In some instances it has revealed personality characteristics that had not previously

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[1] C. W. Leverenz, "M. M. P. I.; and Evaluation of Its Usefulness in the Psychiatric Service of a Station Hospital," War Medicine, IV (December, 1943), 618-29.

[2] Lindsey R. Harman and Daniel N. Wiener, "Use of the Minnesota Multiphasic Personality Inventory in Vocational Advisement," Journal of Applied Psychology, XXIX (April, 1945), 132-41.

[3] Lindsey R. Harman and Daniel N. Wiener, "Use of the Minnesota Multiphasic Personality Inventory in Vocational Advisement," Journal of Applied Psychology, XXIX (April, 1945), 141.

been recognized, and in others offered quantitative confirmation of the clinical impressions of a case history and interview...

It is most useful as a part of a well rounded advisement procedure including tests of vocational aptitudes, mental ability, and vocational interests, and a thorough interview and case history.

Capwell.- After using the Multiphasic in her work with a group of delinquent and non-delinquent adolescent girls, Capwell[1] observed that "each scale except the Hy shows a clear differentiation between the two groups. The greatest difference appears in the scores for Pd."

Harris and Christiansen.- To the fifty three patients who had been diagnosed by experienced therapists, Harris and Christiansen administered the Multiphasic. They concluded that "the most meaningful way to express the agreement with ratings of experienced therapists is to say that there is perfect agreement in more than half the cases; in another third, there is one-step disagreement, e.g., a M. M. rating of Good and a clinical rating of Indifferent, and in only about 10% of the cases is there complete disagreement."[2]

Leverenz.- This writer summarized the results of extended use of the Multiphasic as follows:

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[1] Dora F. Capwell, "Personality Patterns of Adolescent Girls: Delinquents and Non-Delinquents," Journal of Applied Psychology, XXIX (May, 1945), 289-97.

[2] R. E. Harris and Carole Christiansen, "Prediction of Response to Bried Psychotherapy," Journal of Psychology, XXI (March, 1946), 269-84.

After an experience of over one year, the Minnesota Multiphasic Personality Inventory is considered to be of definite value in the neuropsychiatric service at Fort Shelling Station Hospital.

In some instances the Psychiatric clinical investigation was redirected into new channels as a result of inventory scores which revealed hitherto unsuspected abnormal personality changes.

The clinical impression was not always corroborated by the scores obtained on the inventory; however, regardless of the final diagnosis, the clinician was made aware of the fact that one or more abnormal changes in personality existed which required evaluation.

The inventory assisted the clinician in arriving at an earlier and more accurate impression, with a measure of the degree of abnormality. These contributed materially to the decision relative to the soldier's fitness or unfitness for military service.[1]

Abramson.- The Multiphasic was found to be a helpful device, according to Abramson,[2] for the screening for officer candidates. For instance, in a group of officers studied over a year, he found a significant correlation between success in performance of duty and emotional stability.

Kazan and Sheinberg.- In 1945, before the revised F and K scores were published, Kazan and Sheinberg,[3] who had

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[1] C. W. Leverenz, "M. M. P. I.; an Evaluation of Its Usefulness in the Psychiatric Service of a Station Hospital," War Medicine, IV (December, 1943), p.13.

[2] H. A. Abramson, "Multiphasic Personality test in Relation to Selection of Specialized Military Personnel," Psychosomatic Medicine, VII (January, 1945), 178-84.

[3] A. T. Kazan and I. M. Sheinberg, "Clinical Note on the Significance of the M. M. P. I.," American Journal of Psychiatry, CII (January, 1945), 181-3.

studied all F scores above 70 for some 170 army hospital patients, reported that a high F score was only rarely an invalidating score in the consideration of abnormal subjects. They found that it generally indicated the presence of significant and often severe psychiatric disease.

Benton.- A study[1] of the application of the Multiphasic to a group of eighty-five male patients suffering from known disorders yielded the following results:

1. The Inventory identified psychopathic deviates and confessed homosexuals with reasonable accuracy.

2. It was less successful in identifying schizophrenics and hysterics.

He concluded that in its present stage of development (October, 1945) the Multiphasic should not be regarded as a practical clinical test, the results of which can be accepted at face value.

Benton and Probst.- In a subsequent investigation[1] Benton and Probst reported the degree of agreement between four naval psychiatrists' ratings of their patients' traits and these traits as measured by the Multiphasic Inventory. There was a significant degree of agreement between the psychiatrists' ratings and Multiphasic test scores with respect to Psychopathic Deviate, Paranoia, and Schizophrenic trends.

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[1] A. L. Benton, "The M. M. P. I. in Clinical Practice," Journal of Nervous Mental Disease, CII (October, 1945), 416-20.

[2] A. L. Benton and K. A. Probst, "A Comparison of Psychiatric Ratings with M. M. P. I. Scores," Journal of Abnormal Social Psychology, XLI (January, 1946), 75-8.

There was no significant degree of agreement with respect to Hypochondriasis, Depression, Hysteria, Femininity, and Psychasthenic trends. Although in many cases the mean test scores of the psychiatrically rated abnormal groups were higher than those of the normal groups. Especially noteworthy is a complete lack of agreement with respect to the strength of the Hysteria trend.

Lough.- From a study of 185 unmarried women students in a teacher's college, Lough[1] concluded from the results obtained from the Multiphasic, that the women in her study were a relatively stable normal group with a very slight trend toward hypomania, and that there might be a slight relationship between this trend and the large incidence of manic-depressives among teachers hospitalized for mental disorders.

THE KUDER PREFERENCE RECORD

In preceding pages references have been made to studies of the Kuder Preference Record by Patterson, Christensen, Darley, Hahn, Woody, Bordin, and Frandsen. In addition, the following investigations should be noted:

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[1] T. M. Lough, "Teachers College Students and the Minnesota Multiphasic Personality Inventory," Journal of Applied Psychology, XXX (March, 1945), 241-47.

Bolanovich and Goodman.- In a study of sixty cadettes enrolled in a training program for electrical aides, Bolanovich and Goodman[1] found that "The Kuder scores afford some indications that can be helpful in counseling and placement, especially in a situation where there is a variety of job openings." But, "On the basis of correlations with total grade averages, the K. P. R. does not appear to be a promising selection device for predicting course achievement of female engineering Cadettes."[2]

It should be noted that the foregoing sample was exceedingly limited and that the study was made prior to Kuder's 1946 revision of his manual.

Hahn.- In an article that later led to an extensive series of writings, pro and con, on Kuder's classification of occupations, Hahn pointed out that the weakest link in the 1943 manual of directions for the Kuder[3] is the following: "A number of occupations in each area are listed below: The classification of some of these occupations is based on actual experimental data. Most of the occupations, however, are listed because their duties appear to be consistent with the

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[1] D. J. Bolanovich and C. H. Goodman, "A Study of the Kuder Preference Record," Educational and Psychological Measurement, IV (March, 1944), 315-25.

[2] Ibid., p. 325.

[3] G. Frederic Kuder, Manual for the Kuder Preference Record. Chicago: Science Research Associates, 1943. Pp 30.

activities in a particular scale." This Hahn[1] claimed, lessened the value of the Kuder because there are differences of opinion regarding the validity of "arm-chair researchers'" predictions about measured occupational relationships.

It has been indicated that Kuder has since revised his manual in keeping with additional data. In addition to the quoted material above, Kuder now says: "The classification of a number of occupations is based on actual data... scores are being collected systematically from people in various occupations, but for the present, the classifications given must be regarded as tentative for many of the occupations listed."[2]

Lehman.- When the Kuder was given to a group of college home economics students, Lehman[3] found that the Kuder profiles showed no pattern of interests which was characteristic of home economists as a whole. She did find, however, that the interest profiles, when used in relation to other factors, such as, the student's personality, intelligence, special aptitudes, handicaps, health, education, and cultural background, are valuable counseling aids.

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[1] E. Hahn, "Notes on the Kuder Preference Record," Occupations, XXIII (May, 1945), 467-70.

[2] Kuder, Loc. cit. p.3-4.

[3] R. T. Lehman, "Interpretation of the Kuder Preference Record for College Students of Home Economics," Education and Psychology, LV (Autumn, 1944), 217-23.

Peters.- Typical of several studies of relationships between the Strong and the Kuder tests, is one by Peters in which both the Kuder and Strong were given to a group of twenty-four first year college women. Peters[1] found, after studying the data thus derived, that five inter-correlations existed between the two tests which should be given serious consideration by counselors. The use of both tests was recommended.

The intercorrelations derived by Peters are as follows:

Strong	Kuder		
1. Physicians	Scientific	.38 ≠	.1181
2. Office Workers	Computational	.46 ≠-	.1084
3. Authors	Literature	.42 ≠	.1137
4. Lawyers	Social Service	.52 ≠	.1007
5. Lawyers	Scientific	.41 ≠-	.1141

Thompson.- To determine whether certain criteria of success in the study of dentistry are significantly related to scores on personality and interest scales, Thompson used the Kuder as one instrument of measurement. He found[2] that

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[1] Edwin F. Peters, "Vocational Interest as Measured by the Strong and Kuder Inventories," School and Society, LV (April, 1942), 453-5.

[2] G. E. Thompson, "Personality and Interest Factors in Dental School Success," Educational and Psychological Measurement, IV (Winter, 1944), 299-306.

the seniors in dentistry scored above average in Mechanical (91 percentile), Scientific (93 percentile), and Social Service (67 percentile) interest scores on the Kuder, but that Mechanical interests scores did not correlate with either Theory and Technique, nor Practicum criterion scores. However, scientific interest scores correlated positively with Theory and Technique criterion scores, and Social Service interest scores did so with Practicum criterion scores.

Traxler and McCall.- Even back in 1940-41, Traxler and McCall[1] reported findings from their use of the Kuder with high school boys and girls and adults - all based on the first Kuder manual. They concluded that the retest reliability of the Kuder was rather high (a coefficient of correlation of .80 after an interval of a month and .70 after two months). Their additional findings were of a positive nature. Scores were little influenced by "practice in taking" and appeared to have considerable value for relatively long-time predictions. It appeared that interests and motivation were relatively mature by the time pupils reached the secondary school.

A test of reliability, by Traxler, with forty-one students in a graduate class in standard tests, showed that the reliability coefficients for the revised Preference Record

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[1] A. E. Traxler and W. C. McCall, "Some Data on the Kuder Preference Record," Educational and Psychological Measurement, I (March, 1941), 253-68.

are unusually high. The time limitation factor (three days in Traxler's first experiment) was minimized by Traxler and McCall (five weeks), but they too found reliability coefficients between .59 and .91, with an average of .82. He concludes, "These data do suggest that the reliability... compares favorably with that of other measuring instruments of similar length."[1]

Triggs.- Triggs[2] made a study of 267 students at the Personnel Bureau, the University of Illinois. She concluded:

1. That the reliability of the Scales of the Kuder, form BM, is high enough to warrant the use of the Kuder in counseling individuals.

2. That the scales on the test tend to be independent.

3. There is a fair agreement between the Kuder and the Strong.

4. Relationships between achievement and interests as measured by the Kuder, support previously reported conclusions that both types of data are necessary for adequate counselling, though some significant relationships tend to indicate that interests and achievement are not totally unrelated.

Kuder.- Kuder presents median profiles for occupational groups which he revises from time to time as further data are obtained. He says, "The results indicate in general that the names assigned to the various scales are appropriate in terms of type of occupation entered as well as in terms of

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[1] A. E. Traxler, "A Note on the Reliability of the Revised K. P. R.," Journal of Applied Psychology, XXVII (June, 1943), 510-11.

[2] Frances O. Triggs, "A Study of the Relation of Kuder Preference Record Scores to Various Other Measures," Education and Psychology, III (Fall, 1944), 341-54.

the activities for which the scale is scored."[1] In regard to reliability intercorrelations, and validity he speaks as follows:[2]

RELIABILITY

The reliabilities obtained for the Preference Record scales from various groups are listed in Table p. It should be noted that the formula for Case IV as developed by Kuder and Richardson, used for five of the groups, generally obtains figures which are slight underestimates of the true reliabilities. Even so, the average reliabilities for the different scales are all close to .90. The median of the entire table is .91.

INTERCORRELATIONS

Table 6 lists the intercorrelations obtained from the following six groups:

Group 1. 2,667 adult men engaged in occupations, with each major occupational group weighted in proportion to its occurrence in the general population (with the exception of unskilled and semi-skilled workers).

Group 2. 166 college students studied by Triggs.

Group 3. 500 high school boys in the junior class.

Group 4. 1,429 adult women engaged in occupations, with each major occupational group weighted in proportion to its occurrence in the general population.

Group 5. 101 college women studied by Triggs.

Group 6. 500 high school girls in the junior class.

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[1] G. Frederic Kuder, Revised Manual for the Kuder Preference Record. Chicago: Science Research Associates, 1946. Pp.30.

[2] Ibid., pp. 19-21.

RELIABILITIES OF PREFERENCE RECORD SCALES[1]

Group	No. of Cases	Sex	SCALES 1 MEC	2 COM	3 SCI	4 PER	5 ART	6 LIT	7 MUS	8 SOC	9 CLE	Kind of reliability	Data furnished by
Graduate students	41	M&F	.97	.98	.95	.97	.96	.95	.95	.93	.98	Repeat reliability three day interval	Traxler
College students	166	M	.94	.90	.93	.93	.91	.90	.90	.91	.89	Kuder-Richardson, Case IV	Triggs
College students	101	F	.91	.88	.88	.94	.90	.92	.85	.90	.86	Kuder-Richardson, Case IV	Triggs
College students	50	F	.85	.87	.91	.81	.95	.84	.96	.92	.95	Repeat reliability two month interval	Mangold
High school seniors	125	M	.93	.90	.90	.82	.91	.91	.90	.87	.87	Kuder-Richardson, Case IV	Hickman
High school seniors	125	F	.89	.83	.89	.80	.92	.91	.91	.93	.90	Kuder-Richardson, Case IV	Hickman
Eighth grade students	100	M&F	.96	.86	.92	.84	.92	.86	.93	.91	.89	Kuder-Richardson, Case IV	Prosser
Men in occupations	300	M	.95	.91	.89	.89	.90	.93	.94	.93	.88	Kuder-Richardson, C ase IV	Kuder

[1] G. Frederic Kuder, Revised Manual for the Kuder Preference Record. Chicago: Science Research Associates, 1946, p. 19.

It may be noted that the intercorrelations tend to be quite small, particularly among the seven scales originally constructed (Nos. 2 through 8). The one exception to this rule in the original seven scales is the average correlation of about - .38 between the scientific and persuasive scales. The highest correlations in the entire table are between the computational and clerical scales.

NORMS

A profile sheet for use in interpreting scores has been developed from distributions of scores obtained from 1,858 high school boys in the sophomore, junior and senior classes and from 2,005 high school girls in the sophomore, junior and senior classes. In each case the three classes were weighted equally in computing norms. The profile sheet contains separate profiles for boys and girls.

A second profile sheet has been prepared for us with adults, based on groups 1 and 4 described in Section VII on Intercorrelations.

The means and standard deviations on the Preference Record Scales for these groups are given

Norms for high school students in general have been developed in view of research showing there to be little difference between one class and another. Data on this point were presented in the intermediate manual for the Preference Record. Data reported by Woody substantiate these findings.

Norms for college students are being developed, although there is some question as to the value of general college norms in view of the fairly wide variation in average scores among groups from different colleges. The means and standard deviations of various college and university groups are given .....

Percentile norms based on University of Wisconsin freshmen are given ...

Both the Minnesota Multiphasic Personality Inventory and Kuder Preference Record have to be used with an understanding of their limitations. In the writer's study, full cognizance has been taken of the difficulties of measuring

elusive qualities of personality and interest, and whenever possible full allowance has been made for them. However, the interpretations used have been those of the authors of the instruments in question. As better instruments are devised, this study may be extended and/or altered, but at present it is possible to operate only within the limits mentioned above.

Chapter III

THE RELATION BETWEEN PERSONALITY PATTERNS AND OCCUPATIONAL INTERESTS AS REVEALED BY THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY AND THE KUDER PREFERENCE RECORD

As previously stated, 503 cases were used in this study. These were consecutive individuals who took both the Kuder and the Multiphasic tests at the Bureau of Psychological Services at the University of Michigan during a period of approximately two months, namely, from February 1 to March 30, 1947.

After the two tests were scored, this array of 503 cases was divided into "normal" and "maladjusted" categories, 300 in the former and 203 in the latter. This division was based on the standards of the Multiphasic test; that is, any individual with a T-score of 70 or above on one or more of the scales of the Multiphasic was accordingly classified as "maladjusted." The distribution of the cases is presented in Table I.

These two groups were then further divided according to types and origin; that is, these individuals were classified as follows: (1) "Public Law 346." Veterans attending the University under provisions of Public Law No. 346 of the 87th Congress make up this category. There were 336 of these, of whom 191 were classified as normal and 145, maladjusted (Table I). (2) "Public Law 16." Veterans attending the University under provisions of Public Law 16 of the 87th Congress

TABLE I

THE 503 CASES EMPLOYED IN THIS STUDY
DISTRIBUTED AS TO TYPES AND ORIGIN

Origin	Normal		Maladjusted		Differences of Percents[1]	Fisher t
	Number	Percent	Number	Percent		
Public Law 346	191	63.6	145	71.4	8.1	1.89
Public Law 16	14	4.7	11	5.4	0.7	.36
Non Veteran	81	27.0	42	20.7	- 6.3	1.61
Non College	14	4.7	5	2.5	- 2.2	1.27
Total	300	100.0	203	100.0		

[1] Based upon the Normal Group

TABLE II

NORMAL AND MALADJUSTED CASES DISTRIBUTED AS TO SEX

Sex	Normal		Maladjusted		Differences of Percents[1]	Fisher t
	Number	Percent	Number	Percent		
Male	240	80	181	89.2	9.2	2.73**
Female	60	20	22	10.8	- 9.2	2.73**

[1] Based upon the Normal group

** Significant at the 1 percent level

are included here. There were twenty-five of these, of whom fourteen were classified as normal and eleven as maladjusted. (3) "Non-veteran." Students of the University of Michigan who are under neither of the veteran's programs comprise this group. Of these 123 individuals, eighty-one scored "normal" and forty-two, "maladjusted." (4) "Non-college." Persons who were not registered as students at the University when the foregoing tests were administered and who were not included under either of the veterans' programs were listed as "non-college." There were only nineteen of these, of whom fourteen were classified as "normal" and five "maladjusted."

No really significant difference (Table I,Col. 6) was found between the "normal" and "maladjusted" groups. It will be recalled that a Fisher t of 1.96, or greater, indicates a difference significant at the 5 percent level, and values of t of 2.58, or greater, at the 1 percent level.

The over-all pattern of the 503 individuals with whom we are dealing is characteristic of the year-round case load at the Bureau and this two-month sample could be easily duplicated by another taken at some other time. It should be explained that no one is required to take tests nor to contact the Bureau except persons under Public Law No. 16. It is clear that these twenty-five persons constitute only about 5 percent of the total with which we are dealing. This means that the other 95 percent came voluntarily to the Bureau for information and assistance.

At this juncture it may be pointed out that the foregoing situation offers certain advantages for the research which is attempted in this study. Most of the individuals came for help because they wanted it and apparently realized their need for examination and therapy. They knew that they would be given a number of tests and that the results would be used in an attempt to help solve the problems with which they were wrestling. Such a favorable frame of mind toward the taking of tests should greatly reduce the usual objections to the use of pencil and paper personality and interest inventories; in short, one might expect an unusually high degree of cooperation under such circumstances which would yield more valid scores than one would hope to get otherwise.

The sex distribution of the normal and maladjusted cases is shown on Table II. Here there is a predominance of males, since 240 of the three hundred normal cases are men and only sixty are women; an even higher ratio of males is noted in the maladjusted category since there the proportion is 181 to 22. There is a difference of 9.2 percent between the normal and maladjusted groups (Table II, Col. 6), which is significant at the 1 percent level; that is, the chances that this difference is a result of chance is less than 1 percent.

These differences may reflect the predominance of cases in the "Masculinity-Femininity" type of maladjustment on the Multiphasic. There were no females who had significant

scores on this scale, while 46.3 percent of the men had scores high enough to place them in the maladjusted group on that scale alone. It should be remembered that the Masculinity-Femininity scale is still considered "tentative." It was discussed in Chapter II.

Of the 203 cases that had at least one or more T-scores of 70 or more, it was found that about one-half (52.6 percent) had only one such T-score while the remainder had two or more T-scores of 70 or above (Table III). One can thus easily divide the 503 cases into two nearly equal groups by employing the criteria established by the authors of the Multiphasic as described in Chapter II. These groups are labeled M_1 and M_2 in Table III.

According to the authors of the Multiphasic, "any score above T-70 but below T-80 is between two and three standard deviations above the average score of a series of normal individuals and indicates a probable abnormality."[1] Of the 503 cases in question, 203 had one or more scores of T-70 or above on the Multiphasic. Hathaway and McKinley further state,"Most abnormal subjects score above 70 on one or more of the present scales. The majority of clearly abnormal persons score above 70 on two or more scales."[2] The authors point out as well

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[1] J. Charnley McKinley and Starke R. Hathaway. "The Identification and Measurement of the Psychoneuroses in Medical Practice," Journal of the American Medical Association. CXXII (May, 1943), p. 165.

[2] Ibid. p. 164.

TABLE III

NUMBER OF AREAS IN WHICH T-SCORES OF 70 OR ABOVE WERE MADE BY CERTAIN CASES ON THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY

Number of Areas	Number of Cases	Percent
1	107	52.6[a]
2	37	18.2[b]
3	27	13.3[b]
4	15	7.4[b]
5 +	17	8.4[b]

[a] These cases comprise the M_1 group

[b] These cases fall within the M_2 group

that "clearly normal persons do not often score above 70, but if environmental pressure is small or if other personality factors are favorable a person may score over 70, and yet escape need for special attention."[1] In view of this, the maladjusted group has been treated in this study from three angles: (1) A maladjusted group consisting of the 203 cases that had T-scores of 70 or more on any of the scales on the Multiphasic. These are referred to throughout the study as the M, or maladjusted group (Table III, Col. 3). (2) A maladjusted group consisting of 107 cases that had T-scores of 70 or more on only one of the scales on the Multiphasic. These are referred to as M_1 (Table III, Col. 3) and represent 52.6 percent of the maladjusted group. (3) A maladjusted group consisting of ninety-six cases that had T-scores of 70 or more on two or more of the scales on the Multiphasic. These are referred to as M_2 (Table III, Col. 3) and include 47.3 percent of the maladjusted cases.

As was pointed out in Chapter II, the Multiphasic has nine diagnostic scales and the authors of the test feel that a T-score of 70 or above on any one of these scales indicates abnormality, and T-scores of 70 or more on two or

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[1] Starke R. Hathaway and J. Charnley McKinley. Manual for the Minnesota Multiphasic Personality Inventory. New York: The Psychological Corporation, 1943, p.4.

more of them indicates a serious degree of abnormality.[1] Accordingly, in this study, separate tabulations were made for the M_1 group which contained only those individuals with one such T-score, and for the M_2 group which had two or more. Hence throughout this report one can distinguish those individuals whom Hathaway and McKinley consider in some cases "borderline" abnormals, (the M_1 group), from the seriously abnormal individuals (the M_2 group). Tabulations based upon the three groups, M., M_1, M_2, appear in many of the subsequent tables.

The scores on the various diagnostic scales of the Multiphasic for the M, M_1, and M_2 groups are shown on Table IV. It should be recalled that "M" represents the total number of 203 cases that had T-scores of 70 or over on any of the Multiphasic scales; that "M_1" represents the 107 cases that had T-scores of 70 or more on only one scale; and that "M_2" represents the ninety-six cases that had T-scores of 70 or more on two or more scales.

We shall now turn our attention to the consideration of the respective diagnostic groups and how the 203 cases are distributed among them. Table IV is basic here.

Hypochondriasis Scale.- On the (Hs) Hypochondriasis scale,[2] which measures the amount of abnormal concern about

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[1] Starke R. Hathaway and J. Charnley McKinley, Manual for the Minnesota Multiphasic Personality Inventory. New York: The Psychological Corporation, 1943, p.4.

[2] Loc. cit.

TABLE IV

NUMBER OF MALADJUSTED CASES WITH A T-SCORE OF 70 OR ABOVE ON THE MINNESOTA MULTIPHASIC PERSONALITY INVENTORY FOUND IN SPECIFIC DIAGNOSTIC GROUPS

Diagnostic Groups	M_1 Group (107 cases)		M_2 Group (96 cases)		Total M Group: (203 cases)	
	Number	Percent	Number	Percent	Number	Percent
Hypochondriasis	1	0.9	11	11.4	12	5.9
Depression	21	19.6	66	68.6	87	42.9
Hysteria	8	7.4	28	29.1	36	17.7
Psychopathic Deviate	3	2.8	39	40.6	42	20.7
Interest	48	44.8	46	47.8	94	46.3
Paranoia	1	0.9	16	16.6	17	8.4
Psychoasthenia	1	0.9	41	42.6	42	20.7
Schizophrenia	0	0.0	32	33.3	32	15.8
Hypomania	24	22.4	29	30.2	53	26.1
"Lie" Score	0	0.0	1	1.0	1	0.5
"Validity" Score	1	0.9	16	16.6	17	8.4

bodily functions, twelve (5.9 percent) of the M group had T-scores of 70 or above. All of these, except one, were in the M_2 group. People with high scores on this scale are unnecessarily worried over their health, and are characteristically immature in their approach to adult problems, often tending to fail to respond with adequate insight. Often they have long histories of exaggeration of physical complaints and of seeking sympathy. This scale is not appreciably affected by organic sickness. This category seems of minor importance among the college M group.

Depression Scale.- On the (D) Depression Scale,[1] significant scores were recorded for eighty-seven (42.9 percent) of the M group. Of these, sixty-six were in the M_2 group and constituted 68.6 percent of it. So it would seem that most of the cases having high scores on the Depression scale have what McKinley and Hathaway would consider to be marked abnormalities. These authors suggest that depression may be the chief disability of those who score high here, or it may be accompanied by, or be the result of, other personality problems. These high D-scores indicate poor morale of the emotional type often accompanied by feelings of uselessness and inability to assume a normal optimism with regard to the future. Such cases are often well hidden from casual observation. Individuals with

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[1] Starke R. Hathaway and J. Charnley McKinley, Manual for the Minnesota Multiphasic Personality Inventory. New York: The Psychological Corporation, 1943, p. 4.

high D-scores frequently have similar personality backgrounds, in that a person who reacts to stress with depression is characterized somewhat by a lack of self-confidence, a tendency to worry, a narrowness of interest, and introversion. People classified as neurotics usually have high D, H_s, and H_y scores.

It seems to the writer that such a high percentage of the M group in this area may be a result of poor academic training or some other limitation for college work. Then too, this type of depressed individual might have been more apt to seek assistance from the Bureau than some other types of potential neurotics or maladjusted persons. One can only conjecture here.

Hysteria Scale.- On the (H_y) Hysteria scale,[1] a "preliminary" scale, thirty-six (17.7 percent) of the M cases were high. Of these, eight were in the M_1 group and the other twenty-eight in the M_2 group. This may mean that the H_y scale "picks up" a large percentage of highly disturbed individuals.

The Hysteria scale measures the similarity of an individual's score to the scores of patients who have developed conversion-type hysteria symptoms. These symptoms may be general systemic complaints and individuals exhibiting them may also have episodic attacks of weakness, fainting, or convulsions.

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[1] Starke R. Hathaway and J. Charnley McKinley, Manual for the Minnesota Multiphasic Personality Inventory. New York: The Psychological Corporation, 1943, p. 5.

A person may have a high score on this scale without definite symptoms, but under stress he is likely to develop thecharacteristic symptoms or to become overtly hysterical. When such cases occur among college populations they may be explained in part, as the result of the very special kind of strain to which college life exposes an individual. There is competition for marks, special academic awards, social prestige, athletic championships, and recognition by one's intellectual peers. Furthermore tensions may be greatly increased by examinations, fraternity and sorority rushing, athletic contests, and academic functions. Some may meet such increased pressures with a conversion-type hysteria.

Psychopathic Deviate Scale.- Of the M group only forty-two (20.7 percent) had significant scores on the (Pd) Psychopathic Deviate scale.[1] Of these, thirty-nine were in the M_2 group and comprised 40.6 percent of that array. This Pd-scale measures the degree to which the individual resembles patients whose basic difficulty involves the absence of deep emotional response, the inability to profit from experience and their disregard of social mores. Such individuals may be likable and intelligent, although they may be potentially dangerous

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[1] Starke R. Hathaway and J. Charnley McKinely, Manual for the Minnesota Multiphasic Personality Inventory. New York: The Psychological Corporation, 1943, p. 5.

to themselves or to others. This trend toward abnormality is frequently not detected until the individual is in serious trouble, since the person may behave quite normally for several years between outbreaks. The divergent behavior often takes the form of lying, stealing, alcohol or drug addiction, and sexual immorality. That such individuals were picked out of this group by the Multiphasic may have two meanings. On the one hand, some of these cases may be in difficulty already and seeking assistance; and on the other hand, some may be totally unaware of this particular aspect of their personalities, and its potential dangers should therefore be clinically evaluated.

Interest Scale.- The preliminary scale to measure the tendency toward masculinity or femininity of interest pattern, the (M_f) Interest scale,[1] registered ninety-four (46.3 percent) of the M cases as having T-scores of 70 or over. Of these, the M_1 group had forty-eight, or 44.8 percent, and the M_2 group had forty-six, or 47.8 percent. Every item used for this scale indicates a trend in the direction of femininity on the part of male sexual inverts. Such males with high M_f scores have frequently been found to be either overt or repressed sexual inverts.[2] The authors of the Multiphasic

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[1] Starke R. Hathaway and J. Carnley McKinley, Manual for the Minnesota Multiphasic Personality Inventory. New York: The Psychological Corporation, 1943, p. 5.

[2] Ibid, p. 5.

warn that this score alone does not indicate homosexual abnormality without additional confirmatory evidence.

Although it lies outside the limits of this study, it may be proposed that subsequent investigation might verify the hypothesis that a greater number of cases had high scores on this scale than on any other because a select college population was sampled. Such a population might have high scores on the M_f Interest scale for various reasons. Perhaps the Multiphasic scale for M_f Interest is over-weighted with items that reflect the cultural effects of college life and some of the items might have unique significance when one samples only a college population. Perhaps college life by its very nature attracts a greater percentage of M_f Interest deviates than would be found in the general population; that is to say, college life affords opportunities to indulge the more delicate tastes and thereby escape from the reality of the outside world by following such cultural pursuits as one generally attaches to the feminine personality pattern.

Paranoia Scale.- The (P_a) Paranoia scale measures the similarity of the subject to a group of patients who were diagnosed as paranoid, paranoid state, or paranoid schizophrenia and who were characterized by suspiciousness, oversensitivity and delusions of persecution, with or without expansive egotism. However, such persons are common and often are not seriously handicapped. In this category there were only seventeen (8.4 percent) cases in the M group. Sixteen of these were also in the M_2 group and no doubt were at least

borderline paranoiacs if not true paranoiacs. For the particular group being studied, this 8.4 percent is a relatively small proportion, and because of the rather "protected," "understanding" environment of a large university they may have no immediate difficulties. By "protected" and "understanding" the writer refers to the academic freedom enjoyed in university communities. Often individuals in such an environment are less critical of one's ideas, philosophies, and personal demeanor. One exhibiting paranoid characteristics might be considered "odd" or "peculiar" but if he did not become obnoxious, he might be allowed to continue his pattern of life unobstructed and uncriticized.

Psychasthenia Scale.- There were forty-two (20.7 percent) of the M group in the (Pt) Psychasthenia[1] category, and of these all but one were in the M_2 group, of which they represented 42.6 percent. This scale was standardized on patients who were troubled with phobias or compulsive behavior. The compulsive behavior may be either explicit, as excessive hand washing, or it may be such other ineffectual activity as the inability to escape obsessive ideas. The phobias include all types of unreasonable fears. Often individuals with high Pt-scores, with a favorable environment or other compensatory

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[1] Starke R. Hathaway and H. Charnley McKinley, Manual for the Minnesota Multiphasic Personality Inventory, New York: The Psychological Corporation, 1943, p. 6.

factors may not be seriously handicapped; they may be mildly depressed, worry excessively, lack confidence, or be unable to concentrate. This fairly sizeable number of cases presents symptoms commonly found among students and hence symptoms to which little significance would usually be ascribed. Here, too, individuals would probably be considered " odd", but they, no doubt, could continue to function satisfactorily.

Schizophrenia Scale.- The (Sc) Schizophrenia scale, as previously stated, is still "preliminary." Of the M group, thirty-two (15.8 percent) had significant scores on this scale and all thirty-two were in the M_2 group, of which they constituted 33.3 percent. This is in accord with the author's statement that "Most profiles with a high Sc-score will show several other high points ... but this is not surprising in the light of the frequently expressed psychiatric opinion that schizophrenia is not a clinical entity but a group of rather heterogeneous conditions."[1] Patients with such high scores are characterized by bizarre and unusual thoughts or behavior. Often there is a marked splitting of the subjective life of the patient from reality so that the observer cannot follow rationally the shifts in mood or behavior.

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[1] Starke R. Hathaway and J. Charnley McKinley, Manual for the Minnesota Multiphasic Personality Inventory. New York: The Psychological Corporation, 1943, p. 6.

Hypomania Scale.- On the (Ma) Hypomania scale, in the M group fifty-three individuals (26.1 percent) had significantly high scores. These were rather evenly divided between the M_1 and M_2 groups: 22.4 percent of the former and 30.2 percent of the latter had high Ma-scores. This scale measures the personality factors characteristic of people who are hyperactive in both thought and action. Such individuals frequently get into difficulty because they undertake too many things; their moods fluctuate from happiness to depression; often they fail to complete undertakings; and they get otherwise involved because of their disregard for social conventions. The rather large number of persons in the M_1 group may reflect the number of borderline cases who are "normal" depending on the direction that their over-activity takes. It may also be due to the difficulty of differentiating clinically hypomanic patients from normal people who are merely ambitious, vigorous, and active.

Lie Scale.- This is a validating scale which reveals whether a person is trying to alter his score so as to appear more socially acceptable. Only one individual made a significant L-score. The high L-score does not necessarily invalidate the test results for this one case, but it may indicate that his test scores might have been even higher. This one case was in the M_1 group and conceivably might have been related to his other adjustment difficulties. That only one of 503 cases had a significant L-score seems surprising. The almost complete absence of such scores may reflect the

favorable attitude of the group toward the tests to which attention has already been called.

Validity Scale.- This scale is designed to serve as a check on the validity of the whole test and on its scoring. Here seventeen cases (8.4 percent) had T-scores of 70 or above. This situation may indicate carelessness on the part of these individuals or their inability to comprehend the test items. How ever, the latter is unlikely since the seventeen in question were mostly college students and presumably would have no difficulty of that sort.

As was pointed out in Chapter II, Kuder has chosen the 75th percentile as a cutting point on all his scales because "... it is a convenient point which lies between the 1 percent and 5 percent points of significance for normally distributed scores from tests having a reliability of 90."[1] When this 75th percentile cutting score was applied to both the normal and maladjusted groups, it was found that in the former there were significant differences between the scores of these three hundred "normal" individuals and those secured by Kuder's "normal" group as shown on Table V. Theoretically one would expect to find 25 percent of the cases with high

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1 G. Frederic Kuder, Revised Manual for the Kuder Preference Record. Chicago: Science Research Associates, 1946, p.4

TABLE V

HOW 300 NORMAL CASES COMPARE WITH THE NORM OF SIGNIFICANCE ESTABLISHED BY KUDER FOR NINE INTEREST AREAS

Interest Areas	Normal (300 cases)		Difference[1]	Fisher t
	Number	Percent		
Mechanical	79	26.3	1.3	0.52
Computational	74	24.7	- 0.3	0.12
Scientific	107	35.7	10.7	4.28**
Persuasive	92	30.6	5.6	2.24*
Artistic	102	34.0	9.0	3.60**
Literary	93	31.0	6.0	2.40*
Musical	129	43.0	18.0	7.20**
Social Service	66	22.0	- 3.0	1.20
Clerical	48	16.0	- 9.0	3.60**

[1] Between normal cases and Kuder's theoretical 25 percent which exceed the 75th percentile

* Significant at the 5 percent level

** Significant at the 1 percent level

scores in each of the areas on the Kuder; but probably due to differences in sampling, the discrepancies indicated in Table V occurred. This table indicates that the normal group in this study differed from Kuder's theoretical group on several of the scales. For instance,it had more cases which scored high on the Musical, Scientific, Artistic, Persuasive, and Literary scales (differences significant at the 1 percent level of confidence for all except the last two which were significant at the 5 percent level). The same normal group also had significantly fewer high scores on the Clerical scale (Table V, Col.5). This may be partially explained by the limited nature of the experimental group, nearly all of whom were college students, and therefore had little interest in the clerical area.

A highly significant and unique phase of this study should be pointed out at this time. The population used for this study, as has frequently been explained, was a rather select college group. By using both a normal and a maladjusted sample from the same general population, this problem of selection was taken into consideration. For instance, three groups are really available for comparison. Thus Kuder has a theoretically "normal" group on which he has standardized his test scores. Of this group, 25 percent have scores above the 75th percentile on each of the nine Kuder scales. However, in the present study, the percent of the normal group having scores above the 75th percentile varies for each scale as

explained on pages 74 and 76 . But, when this group, whose variation from Kuders' "normal" may be the result of selected sampling, is construed as "normal" for the University of Michigan, it becomes the criterion for determining the existence of the third group mentioned above, namely, the array of 203 maladjusted students who constitute group M. From previous discussion (p. 70), it is clear that this category varies much more widely from the Kuder than from the Michigan "normal."

When the significance of occupational interests of the normal and maladjusted groups is compared (Table VI) it is found that the latter had a greater number of cases with significantly high scores in the Literary, Musical, and Artistic areas than the former. The differences on the Literary and Musical scales were significant at the 1 percent level and on the Artistic at the 5 percent level (Table VI, Col. 7). Forty-three percent of the normal group and 55.1 percent of the maladjusted group had scores above the 75th percentile on the Musical scale, and on the Literary scale 31 percent of the normal and 47.7 of the maladjusted group had high scores. There were 34 percent of the normal and 42.9 percent of the maladjusted persons with scores above the 75th percentile on the Artistic scale. That is to say, the difference between the normal and maladjusted groups as shown in Figure 1 is a real difference and not one due to chance. The maladjusted group, also had a fewer number of cases with significantly high scores in the

TABLE VI

NUMBER OF CASES REACHING THE 75th PERCENTILE OR ABOVE IN THE RESPECTIVE GENERAL INTEREST AREAS OF THE KUDER PREFERENCE RECORD

Interest Areas	Normal (300 cases)		Maladjusted (203 cases)		Differences of percents[1]	Fisher t
	Number	Percent	Number	Percent		
Mechanical	79	26.3	31	15.3	- 11.0	2.93**
Computational	74	24.7	44	21.7	- 3.0	.78
Scientific	107	35.7	43	21.2	- 14.5	3.49**
Persuasive	92	30.6	61	30.0	- 0.6	.14
Artistic	102	34.0	87	42.9	8.9	2.02*
Literary	93	31.0	97	47.7	16.7	3.79**
Musical	129	43.0	112	55.1	12.1	2.67**
Social Service	66	22.0	49	24.1	2.1	.55
Clerical	48	16.0	36	17.7	1.7	.50

[1] Based upon the Normal group

* Significant at the 5 percent level

** Significant at the 1 percent level

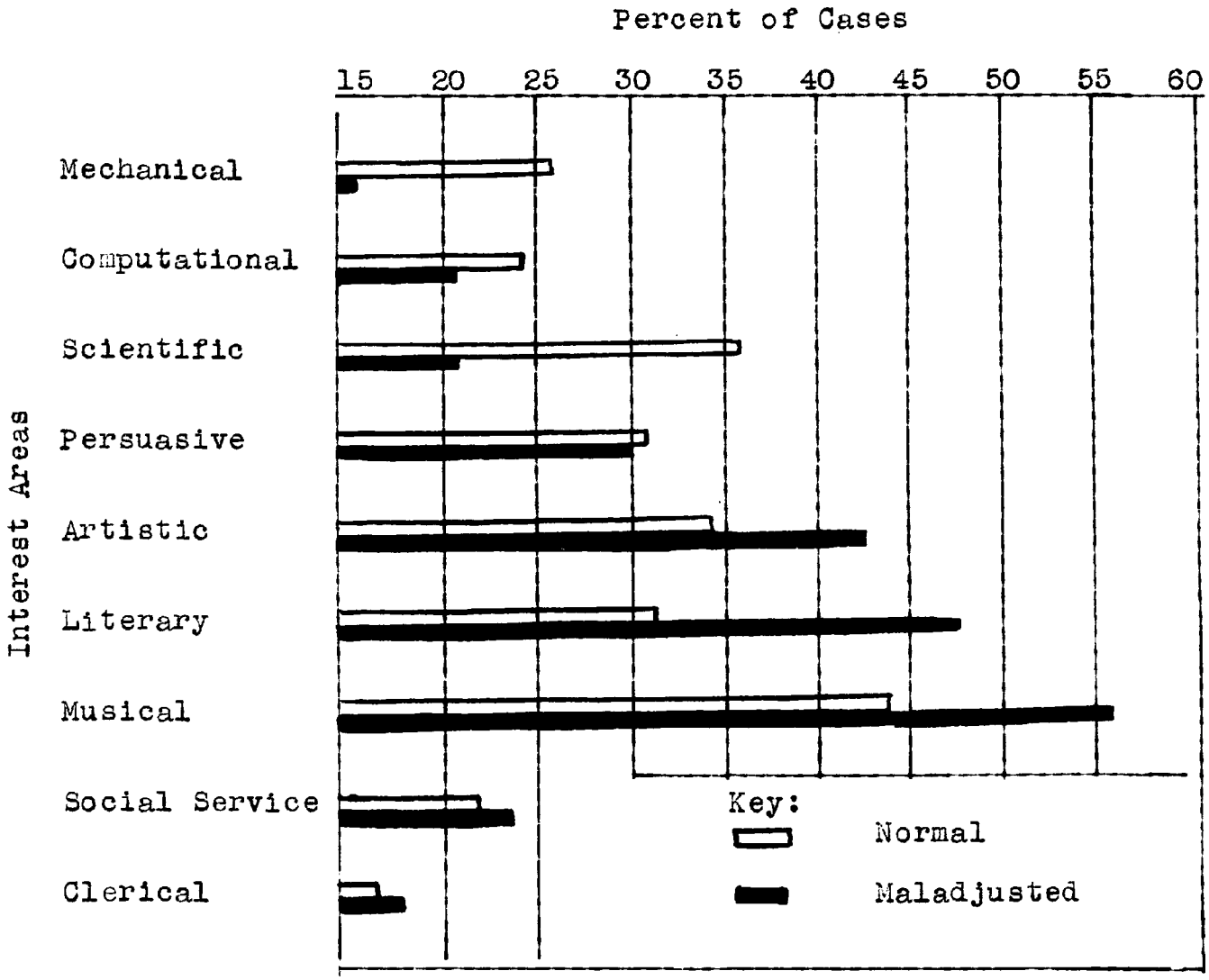

Fig. 1.- Percentages of normal and maladjusted cases reaching the 75th percentile or above in the respective interest areas of the Kuder Preference Record.

Scientific and Mechanical areas than had the normal group. The difference in percents between the two groups was significant at the 1 percent level (Table VI, Co. 7). In contrast with the 26.3 percent of the normal group that had high scores on the Mechanical scale, only 15.3 percent of the maladjusted group had similarly high scores. On the Scientific scale 35.7 percent of the normal and only 21.2 percent of the maladjusted individuals had scores above the 75th percentile. This overall pattern of differences (Figure 2) is extremely important in itself because it is also the pattern of the Kuder upon which the use of that instrument for clinical purposes is established. Kuder indicates that the total profile of occupational interests must be studied.[1] Therefore, to interpret an individual's interest scores, one must take into consideration those that lie above the 75th and those below the 25th percentile. It is this total constellation that is pertinent in counseling. This point will be discussed at length in the pages which follow.

Now let us look at the results presented in Table VI, item by item.

Mechanical Scale.- When the normal and maladjusted groups are compared, we find that 26.3 percent of the normal

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[1] G. Frederic Kuder, Revised Manual for the Kuder Preference Record. Chicago: Science Research Associates, 1946, p. 6.

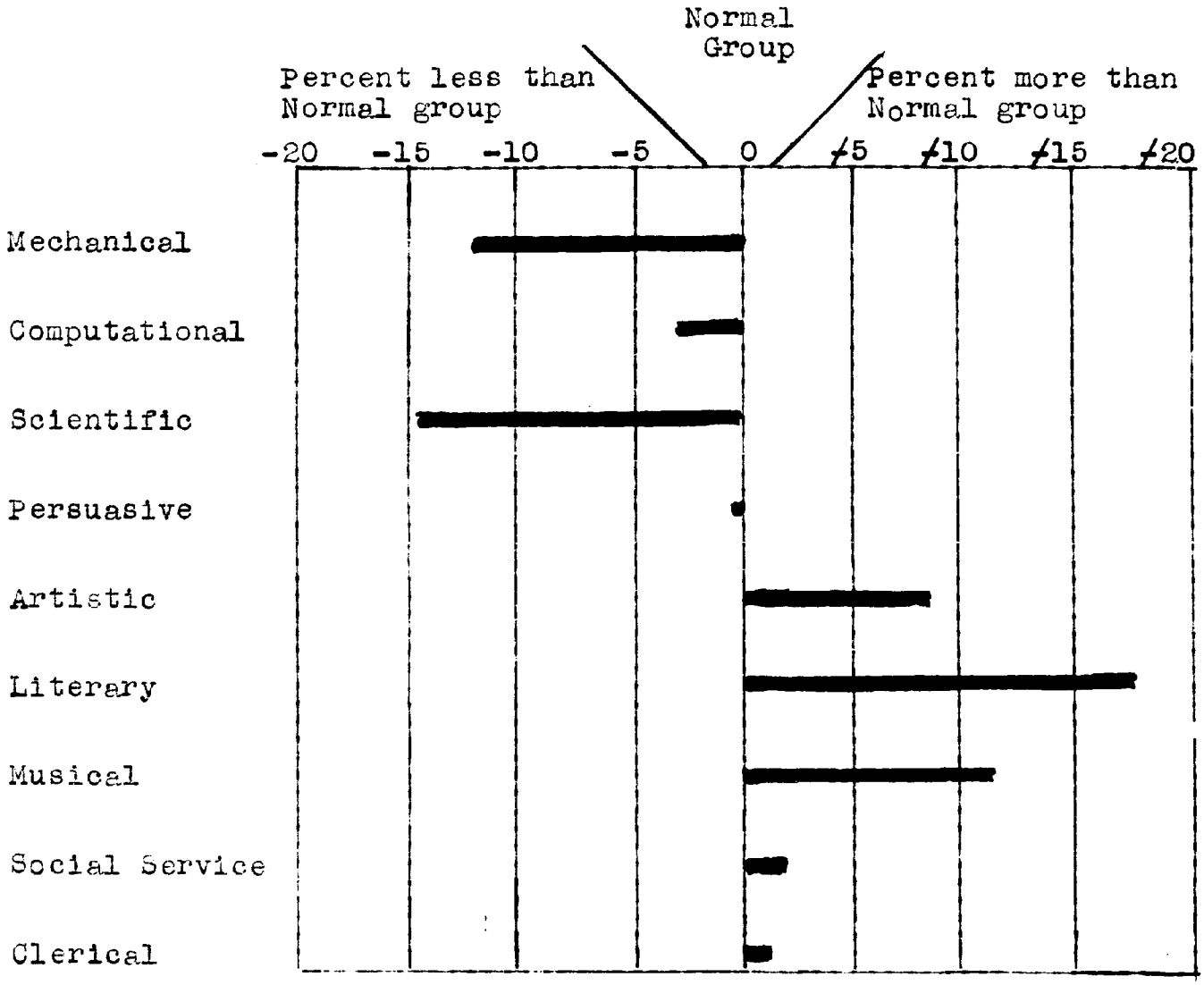

Figure 2.- Differences in percent of cases between the Maladjusted and Normal groups on the Interest Scales of the Kuder Preference Record.

group and only 15.3 percent of the maladjusted group have significantly high scores on the Mechanical scale of the Kuder. This difference is significant at the 1 percent level. Apparently the person who has a high score on the Mechanical scale is less apt to have a significant score on the Multiphasic.

That more of the normal than of the maladjusted group have high scores on the Mechanical scale may be related to the type of activities characteristic of the Mechanical areas. The writer feels that this distribution on the Mechanical scale is in accord with his observations at the Bureau of Psychological Services and those of several of his colleagues. It seemed that individuals with relatively high scores on the Mechanical scale were less apt to have abnormal scores on the Multiphasic. It is possible that this may be due to the specific items Kuder has chosen as factors on the Mechanical scoring items, but such is a postulate outside the scope of the present investigation.

Computational Scale.- On the Computational scale one finds 24.7 percent of the normal and 21.7 of the maladjusted cases; however, the significant difference of these two percents is only t .78. Hence no valid differences can be claimed, but the very similarity of the two groups in their scores on this scale is in itself significant. It would seem that an individual would not more be likely to be maladjusted if he were high on this scale than if he were not high on it; that is, for the present sample of college students one may say that

a normal person is as likely to be high on this scale as is a maladjusted person. That fewer of the present maladjusted individuals scored high than would normally be expected may reflect the possibility that some of them reject anything that is methodical, routine, detailed, or realistic. Although the preceding statement is a mere conjecture, it may constitute one of the reasons why the maladjusted individuals in this study have less than 25 percent of their scores significantly high on the Computational scale. This will have to be left for further investigation.

Scientific Scale.- On the Scientific scale, 35.7 percent of the normal and 21.2 percent of the abnormal group had high scores. The difference between these two percents was significant at the 1 percent level. The Fisher *t* of 3.49 (Table VI, Col. 7) indicates that the maladjusted individuals were less apt to have high scores on the Scientific scale than were the normal individuals. The writer feels that this reflects the rejection of things which are realistic and exacting on the part of maladjusted individuals. He also feels that this, in turn, is the result of a greater number of cases having certain types of maladjustments. The selective character of the population, that is, college students, tends to emphasize scientific interests to a greater degree than would otherwise be true. This has already been discussed at length in this chapter.

Persuasive Scale.- On the Persuasive scale, 30.6 percent of the normal and 30 percent of the maladjusted cases fall above the 75th percentile, but the Fisher t is only .14. Thus there is no established difference between the normal and maladjusted groups upon which any predictions may be based as to whether an individual with a high score on the Persuasive scale would have a normal or maladjusted score on the Multiphasic. In the writer's judgment this seems to remove a fallacious idea he and some others had had that persons who scored high on the Persuasive scale were very likely to have maladjusted personalities and therefore make abnormal scores on the Multiphasic. The chances are nearly even that such persons would be normal. At least the present evidence does not allow one to predict that a person is more or less apt to have a measurable personality difficulty if he has a high score on the Persuasive scale.

Artistic Scale.- Thirty-four percent of the normal cases had significantly high scores on the Artistic scale, whereas 42.9 percent of the maladjusted group fell at or above the 75th percentile. The difference between these percents was significant at the 5 percent level. On this basis, maladjusted individuals are more apt than normal ones to have high scores on the Artistic scale. Although 5 percent of this difference may be due to chance (Fisher t 2.02: Table VI, Col. 7) the clinician can be fairly sure that a person having a high score on the Artistic scale is more apt to be maladjusted than

a person having a high score on an area such as the Mechanical.

Literary Scale.- On the Literary scale, 31 percent of the normal cases and 47.7 percent of the maladjusted had high scores. The difference between these two percents was significant at the 1 percent level. That a greater percentage of maladjusted than of normal individuals have high scores on the Literary scale means that a clinician or counselor should watch for symptoms of maladjustment when a person has a high score on this scale of the Kuder. Maladjusted individuals are more apt to have high scores on the Literary scale than are normal individuals.

Musical Scale.- Forty-three of the normal group and 55.1 percent of the maladjusted group had high scores on the Musical scale. Even though the percentage of the normal group was high, there still was a difference in the two groups significant at the 1 percent level. Apparently a maladjusted individual is more apt to have a high score on this scale than is a normal individual.

Social Service Scale.- Only 22 percent of the normal group and 24.1 percent of the maladjusted group had significant scores on the Social Service scale. Since there is no significant difference between these two groups (Table VI, Col. 7) one could say that the present data afford no basis for predicting how an individual might score on the Multiphasic. A person with a high score on the Social Service scale is as likely to have a normal as an abnormal score on the Multiphasic.

Clerical Scale.- On the Clerical scale only 16 percent of the normal group and 17.7 percent of the maladjusted had high scores; there was no significant difference.

There is a suspicion that the pattern of total scores accepted and rejected determines the occupational group with which the individual is identified on the Kuder.[1] In this connection Kuder states, "When tables and equations are developed eventually for interpreting the whole profile, the low as well as the high scores will be taken into account ... it may be found that an occupation indicated by high scores on some scales should be eliminated in view of low scores on other scales."[2]

In our array of individuals it was found that about 32 percent showed significant scores in two areas on the Kuder - 32.3 percent of the normal and 31.5 percent of the maladjusted individuals to be exact - and about 35 percent did so in three areas; that is, 34.3 percent of the normal and 37.3 percent of the maladjusted persons (Table VII). Thus we see that about one-third of the cases had scores on two areas above the 75th percentile and about one-third had three such scores.

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1 G. Frederic Kuder, Revised Manual for the Kuder Preference Record. Chicago: Science Research Associates, 1946. p.4.

2 Loc. cit.

TABLE VII

NUMBER OF INDIVIDUAL AREAS IN WHICH BOTH NORMAL AND MALADJUSTED CASES REACHED THE 75th PERCENTILE OR ABOVE ON THE KUDER PREFERENCE RECORD

Number of Areas	Normal		Maladjusted		Differences in Percents[1]	Fisher t
	Number	Percent	Number	Percent		
0	2	0.7	1	0.5	-0.2	0.28
1	38	12.7	19	9.3	-3.4	1.18
2	97	32.3	64	31.5	-0.8	0.19
3	103	34.3	76	37.3	3.0	0.63
4	51	17.0	31	15.3	-1.7	0.51
5	9	3.0	11	5.4	2.4	1.36
6 or more	0	0.0	1	0.5	0.5	1.23

[1] Based on normal group

Kuder has recognized that individuals will have various combinations of significant scores. In the section of his manual labeled, "How to Use the Table," Kuder has given these directions: "Look over the profile to see which scores are above the 75th percentile ... Directions are given ... according to the number of high scores."[1] He then gives instructions for using the scores when an individual has one, two, more than two, and no high scores.

At this point let us turn our attention to Tables VIII through XVI inclusive, for an analysis of the combinations, suggested by Kuder, in which some of our normal and maladjusted cases were significantly high; that is, at the 75th percentile or above.

Mechanical and other areas.- As shown in Table VIII, Column 7, more normal individuals than maladjusted had significantly high scores on the Kuder Mechanical and Scientific, Mechanical and Persuasive, Mechanical and Musical, and the Mechanical and Social Service areas. Only the first combination, Mechanical and Scientific, had a difference significant at the 1 percent level as indicated by its Fisher *t* of 2.80. The remainder of the foregoing were significant at the 5 percent level.

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[1] G. Frederic Kuder, Revised Manual for the Kuder Preference Record. Chicago: Science Research Associates, 1946, p. 4.

TABLE VIII

NUMBER OF CASES REACHING THE 75th PERCENTILE OR ABOVE IN BOTH THE MECHANICAL AND OTHER INTEREST AREAS OF THE KUDER PREFERENCE RECORD

Interest Areas	Normal		Maladjusted		Differences of Percents[1]	Fisher t
	Number	Percent	Number	Percent		
Mechanical Computational	19	6.3	11	5.4	- 0.9	0.42
Mechanical Scientific	41	13.7	12	5.9	- 7.8	2.80**
Mechanical Persuasive	12	4.0	2	1.0	- 3.0	2.00*
Mechanical Artistic	35	11.3	14	6.9	- 4.4	1.64
Mechanical Literary	13	4.3	7	3.4	- 0.9	0.51
Mechanical Musical	27	9.0	9	4.4	- 4.6	1.97*
Mechanical Social Service	7	2.3	3	1.4	- 0.9	2.22*
Mechanical Clerical	12	4.0	3	1.4	- 2.6	1.68
Mechanical	79	26.3	31	15.3	-11.0	2.93**

[1] Based upon the normal group

* Significant at the 5 percent level

** Significant at the 1 percent level

Computational and other areas.- Table IX indicates that no significant differences were found between normal and maladjusted individuals who had high scores on the Computational and any other one of the Kuder scales. Although there were differences in percents as shown in Column 6, Table IX, their respective Fisher *t* scores were too small to warrant basing conclusions upon them other than the foregoing generalization.

Scientific and other areas.- Persons with high scores on the Scientific scale or Scientific and Mechanical scale were more apt to be normal than to be maladjusted (Table X). Of the normal group, forty-one cases (13.7 percent) had high scores on both the Scientific and Mechanical scales, and of the maladjusted group, twelve (5.9 percent) had such scores. With or without high scores on other scales, 35.7 percent of the normal and 21.2 percent of the maladjusted cases with which we are dealing registered high scores on the Scientific - a difference significant at the 1 percent level as shown by a Fisher *t* of 3.49. This means that when a high Scientific score was combined with a similar one in any one of the other areas, no significant difference was found between the normal and maladjusted groups.

Persuasive and other areas.- In only one instance was a significant difference found between normal and maladjusted individuals in the combinations shown in Table XI. This was in the Persuasive-Mechanical area at the 1 percent level. Such persons were more likely to be normal than

TABLE IX

NUMBER OF CASES REACHING THE 75th PERCENTILE OR ABOVE IN BOTH THE COMPUTATIONAL AND OTHER INTEREST AREAS OF THE KUDER PREFERENCE RECORD

Interest Areas	Normal		Maladjusted		Difference of Percents[1]	Fisher t
	Number	Percent	Number	Percent		
Computational Mechanical	19	6.3	11	5.4	- 0.9	0.42
Computational Scientific	37	12.3	15	7.4	- 4.9	1.77
Computational Persuasive	16	5.3	11	5.4	0.1	0.05
Computational Artistic	19	6.3	16	7.9	1.6	0.69
Computational Literary	17	5.7	18	8.9	3.2	1.39
Computational Musical	27	9.0	20	9.8	0.8	0.30
Computational Social Service	9	3.0	7	3.4	0.4	0.25
Computational Clerical	25	8.3	17	8.4	0.1	0.04
Computational	74	24.7	44	21.7	-3.0	0.78

1 Based upon the normal group

* Significant at the 5 percent level

** Significant at the 1 percent level

TABLE X

NUMBER OF CASES REACHING THE 75th PERCENTILE OR ABOVE IN BOTH THE SCIENTIFIC AND OTHER INTEREST AREAS OF THE KUDER PREFERENCE RECORD

Interest Areas	Normal		Maladjusted		Differences of Percents[1]	Fisher t
	Number	Percent	Number	Percent		
Scientific Mechanical	41	13.7	12	5.9	- 7.8	2.80**
Scientific Computational	37	12.3	15	7.4	- 4.9	1.77
Scientific Persuasive	10	3.3	4	2.0	- 1.3	0.87
Scientific Artistic	32	10.7	17	8.4	- 2.3	0.85
Scientific Literary	28	9.3	15	7.4	- 1.9	0.75
Scientific Musical	39	13.0	21	10.4	- 2.6	0.88
Scientific Social Service	18	6.0	9	4.4	- 1.6	0.79
Scientific Clerical	10	3.3	2	1.0	- 2.3	1.65
Scientific	107	35.7	43	21.2	-14.5	3.49**

1 Based upon the normal group

* Significant at the 5 percent level

** Significant at the 1 percent level

TABLE XI

NUMBER OF CASES REACHING THE 75th PERCENTILE OR ABOVE IN BOTH THE PERSUASIVE AND OTHER INTEREST AREAS OF THE KUDER PREFERENCE RECORD

Interest Areas	Normal		Maladjusted		Differences of Percents[1]	Fisher t
	Number	Percent	Number	Percent		
Persuasive Mechanical	12	4.0	2	1.0	- 3.0	2.00*
Persuasive Computational	16	5.3	11	5.4	0.1	0.05
Persuasive Scientific	10	3.3	4	2.0	- 1.3	0.87
Persuasive Artistic	17	5.7	14	6.9	1.2	0.55
Persuasive Literary	33	11.0	30	14.8	3.8	1.26
Persuasive Musical	33	11.0	25	12.3	1.3	0.46
Persuasive Social Service	23	7.7	15	7.4	- 0.3	0.13
Persuasive Clerical	18	6.0	14	6.9	0.9	0.41
Persuasive	92	30.6	61	30.0	- 0.6	0.14

[1] Based upon the normal group

* Significant at the 5 percent level

** Significant at the 1 percent level

maladjusted. However, the difference of percents was only 3.0 (Col. 6) since only twelve normal cases and two maladjusted had high scores on both the Persuasive and Mechanical scales. These numbers are too small to make even the Fisher t of 2.00 a very reliable indication.

Artistic and other areas.- A person with high scores on both the Artistic and Literary, Artistic and Musical, or Artistic-Interest scales is apt to be maladjusted (Table XII). There were twenty-nine (9 percent) normal and forty-one (20.2 percent) maladjusted cases with scores above the 75th percentile on both the Artistic and Literary scales. This difference was significant at the 1 percent level, with a Fisher t score of 3.56 (Col. 7). The other two combinations had differences significant, as indicated, at the 5 percent level. No significant difference in scores on the Kuder was found between normal and maladjusted groups that had high scores on areas other than Literary and Musical in combination with the Artistic scale.

Literary and other areas.- In Table XIII are recorded the cases which reached the 75th percentile in both the Literary and other interest areas. Besides the Literary area as such, where a Fisher t of 3.79 is recorded, three combinations reveal significant differences between the normal and the maladjusted arrays namely, Literary and Artistic, Literary and Musical, and Literary and Clerical. In all these

TABLE XII

NUMBER OF CASES REACHING THE 75th PERCENTILE OR ABOVE IN BOTH THE ARTISTIC AND OTHER INTEREST AREAS OF THE KUDER PREFERENCE RECORD

Interest Areas	Normal		Maladjusted		Differences of Percents[1]	Fisher t
	Number	Percent	Number	Percent		
Artistic Mechanical	35	11.3	14	6.9	- 4.4	1.64
Artistic Computational	19	6.3	16	7.9	1.6	0.69
Artistic Scientific	32	10.7	17	8.4	- 2.3	0.85
Artistic Persuasive	17	5.7	14	6.9	1.2	0.55
Artistic Literary	29	9.0	41	20.2	11.2	3.56**
Artistic Musical	56	18.7	55	27.1	8.4	2.23*
Artistic Social Service	9	3.0	13	4.4	1.4	0.75
Artistic Clerical	10	3.3	9	4.9	1.6	0.93
Artistic	102	34.0	87	42.9	8.9	2.02*

[1] Based upon the normal group

* Significant at the 5 percent level

** Significant at the 1 percent level

TABLE XIII

NUMBER OF CASES REACHING THE 75th PERCENTILE OR ABOVE IN BOTH THE LITERARY AND OTHER INTEREST AREAS OF THE KUDER PREFERENCE RECORD

Interest Areas	Normal		Maladjusted		Differences of Percents[1]	Fisher t
	Number	Percent	Number	Percent		
Literary Mechanical	13	4.3	7	3.4	- 0.9	0.51
Literary Computational	17	5.7	18	8.9	3.2	1.39
Literary Scientific	28	9.3	15	7.4	- 1.9	0.75
Literary Persuasive	33	11.0	30	14.8	3.8	1.26
Literary Artistic	29	9.0	41	20.2	11.2	3.56**
Literary Musical	46	15.3	61	30.0	14.7	3.96**
Literary Social Service	16	5.3	20	9.8	4.5	1.93
Literary Clerical	12	4.0	17	8.4	4.4	2.09*
Literary	93	31.0	97	47.7	16.7	3.79**

[1] Based upon the normal group

* Significant at the 5 percent level

** Significant at the 1 percent level

instances differences significant at the 1 percent level exist except in the Literary-Clerical combination, where it is found at the 5 percent level. A total of sixty-one cases (30 percent) of the maladjusted group had high scores on both the Literary and Musical scales, while only forty-six (15.3 percent) of the normal group had scores above the 75th percentile on them. This represents the high point in the difference between the normal and the maladjusted cases listed in Table XIII. From the foregoing facts one gathers that an individual might be expected to have T-scores of 70 or above on the Multiphasic when he scores at the 75th percentile.

Musical and other areas.- Difference of percents significant at the 1 percent level were found between normal and maladjusted persons with high scores on the Musical, and on the Musical and Literary scales of the Kuder (Table XIV). However, differences significant at the 5 percent level were discovered for those with highs on the Musical and Mechanical and on the Musical and Artistic combinations. In all these cases the individual would likely have abnormal scores on the Multiphasic; that is, a person with a high score on both the Musical and Literary scales would be more apt to have a T-score of 70 or more on some diagnostic scale of the Multiphasic than he would be to have a normal score, since such occurrence would be the result of chance less than 1 percent of the time.

TABLE XIV

NUMBER OF CASES REACHING THE 75th PERCENTILE OR ABOVE IN BOTH THE MUSICAL AND OTHER INTEREST AREAS OF THE KUDER PREFERENCE RECORD

Interest Areas	Normal		Maladjusted		Differences of Percents[1]	Fisher t
	Number	Percent	Number	Percent		
Musical Mechanical	27	9.0	9	4.4	- 4.6	1.97*
Musical Computational	27	9.0	20	9.8	0.8	0.30
Musical Scientific	39	13.0	21	10.4	- 2.6	0.88
Musical Persuasive	33	11.0	25	12.3	1.3	0.46
Musical Artistic	56	18.7	55	27.1	8.4	2.23*
Musical Literary	46	15.3	61	30.0	14.7	3.96**
Musical Social Service	26	8.7	26	12.9	4.2	1.52
Musical Clerical	20	6.7	16	7.9	1.2	0.51
Musical	129	43.0	112	55.1	12.1	2.67**

1 Based upon the normal group

* Significant at the 5 percent level

** Significant at the 1 percent level

Social Service and other areas.- In only one instance was a significant difference discovered in the Social Service areas as recorded in Table XV. This difference (Fisher t, 2.22) occurred between the two basic groups in the Social Service and Mechanical combinations. The size of the Fisher t indicates that the difference is significant at the 5 percent level. But it should be pointed out that since only seven normal and three maladjusted persons had scores above the 75th percentile on both the Social Service and Mechanical areas, it would be hazardous to predict with confidence what the situation would be if a larger population were involved at this point.

Clerical and other areas.- Individuals with high scores on both Clerical and Literary scales were more apt to be in the maladjusted group, as indicated by the difference between the percentages of the normal and maladjusted groups which have these combined scores (Table XVI). The difference was significant at the 5 percent level of confidence. In regard to the Clerical and any other Kuder scale, no significant difference was found between the normal and maladjusted aggregations.

From the evidence thus far presented one may conclude that for any specific occupation which Kuder lists in his "Classification of Occupations According to Major Interests,"[1] one

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[1] G. Frederic Kuder, Revised Manual for the Kuder Preference Record. Chicago: Science Research Associates, 1946, p. 5.

TABLE XV

NUMBER OF CASES REACHING THE 75th PERCENTILE OR ABOVE IN BOTH THE SOCIAL SERVICE AND OTHER INTEREST AREAS OF THE KUDER PREFERENCE RECORD

Interest Areas	Normal		Maladjusted		Differences of Percents[1]	Fisher t
	Number	Percent	Number	Percent		
Social Service Mechanical	7	2.3	3	1.4	- 0.9	2.22*
Social Service Computational	9	3.0	7	3.4	0.4	0.25
Social Service Scientific	18	6.0	9	4.4	- 1.6	0.79
Social Service Persuasive	23	7.7	15	7.4	- 0.3	0.13
Social Service Artistic	9	3.0	13	4.4	1.4	0.75
Social Service Literary	16	5.3	20	9.8	4.5	1.93
Social Service Musical	26	8.7	26	12.9	4.2	1.52
Social Service Clerical	1	0.3	4	1.97	1.2	0.51
Social Service	66	22.0	49	24.1	2.1	0.55

1 Based upon the normal group

* Significant at the 5 percent level

** Significant at the 1 percent level

TABLE XVI

NUMBER OF CASES REACHING THE 75th PERCENTILE OR ABOVE IN BOTH THE CLERICAL AND OTHER INTEREST AREAS OF THE KUDER PREFERENCE RECORD

Interest Areas	Normal		Maladjusted		Differences of Percent[1]	Fisher t
	Number	Percent	Number	Percent		
Clerical Mechanical	12	4.0	3	1.4	- 2.6	1.68
Clerical Computational	25	8.3	17	8.4	0.1	0.04
Clerical Scientific	10	3.3	2	1.0	- 2.3	1.65
Clerical Persuasive	18	6.0	14	6.9	0.9	0.41
Clerical Artistic	10	3.3	9	4.9	1.6	0.93
Clerical Literary	12	4.0	17	8.4	4.4	2.09*
Clerical Musical	20	6.7	16	7.9	1.2	0.51
Clerical Social Service	1	0.3	4	2.0	1.7	1.88
Clerical	48	16.0	36	17.7	1.7	0.50

[1] Based upon the normal group

* Significant at the 5 percent level

** Significant at the 1 percent level

might anticipate a relationship between it as a component of a general interest area and an individual's score on the Multiphasic. This would be ascertained by checking what the present data reveal concerning how individuals who have high scores on that particular scale or combination of scales score on the Multiphasic. For example, the specific job title, "Teacher of Languages," is classified by Kuder under the Literary scale. Table V,p.71 shows that persons with high scores on the Literary scale are more apt to have "abnormal" than "normal" scores on the Multiphasic. Moreover, Table XIX, p.107,108, and109, shows that the persons with whom we are dealing and who have high Literary scale scores are likely to have high scores on any of the Multiphasic scales, and that a few more score higher on the Interest and Depression scales than on the others. From all of this the counselor gains a clinical clue that teachers of languages for instance, have a higher potentiality for maladjustment than for normality. He is also warned to watch for symptoms of Interest deviation and of Depression.

Further, "Siliviculturist" is classified by Kuder under the combined Scientific-Artistic scale. Table X,p. 88 presents evidence that persons with high scores on the combined Scientific- Artistic scale are as apt to be normal as they are to be maladjusted according to the Multiphasic criteria.

Finally, "Ballet Dancer" is listed under the combined Artistic-Musical scale. Table XII indicates that persons with

high scores on these two scales are more likely to have T-scores of 70 o r above on the Multiphasic than they are to have normal scores. This difference is significant at only the 5 percent level, however.

Probably the same elements of difference of sampling that were pointed out in the discussion of Table V, "How 300 Normal Cases Compare with the Norm of Significance Established by Kuder for Nine Interest Areas" as well as the high scores on the Kuder are operative in the results presented in Table XVII which shows how three hundred cases compare with Kuder's "normal" group. That is, owing to the college-student population used in this study, one might anticipate divergencies from Kuder's expected 25 percent of the total cases which fall below the 25th percentile. Such is the case. Thus, on the Clerical scale 41 percent of the normal individuals rather than the expected 25 percent had scores below the 25th percentile (hereafter referred to as "low score"), a difference significant at the 1 percent level. Thirty-seven percent of the normal group in this study had low scores on the Social Service scale, a difference which is also significant at the 1 percent level. A difference significant at the 5 percent level (a Fisher *t* of 2.12, Table XVII, Col. 5) was found between the 30.3 percent of the normal cases that had low scores on the Computational scale and the expected 25 percent. On the Musical scale, the present normal group had only 12 percent as

TABLE XVII

HOW 300 NORMAL CASES COMPARE WITH THE GROUPS USED BY KUDER AS NORMS FOR NINE INTEREST AREAS

Interest Areas	Normal		Difference[1]	Fisher t
	Number	Percent		
Mechanical	70	23.3	- 1.7	0.68
Computational	91	30.3	5.3	2.12*
Scientific	59	19.7	- 5.3	2.12*
Persuasive	76	25.3	0.3	0.12
Artistic	63	21.0	- 4.0	1.60
Literary	74	24.7	- 0.3	0.12
Musical	36	12.0	- 13.0	5.20**
Social Service	112	37.3	12.3	4.92**
Clerical	123	41.0	16.0	6.40**

[1] Between normal cases and Kuder's theoretical 25 percent which fall below the 25th percentile

* Significant at the 5 percent level

** Significant at the 1 percent level

contrasted with Kuder's 25 percent who had scores below the 25th percentile. This group had a Fisher *t* of 5.20 which indicated that such a difference could occur by chance in even less than 1 percent of the time (Table XVII, Col. 5). On the Scientific scale, 19.7 percent of the normal cases had low scores representing a difference which is significant at the 5 percent level of confidence. All of this is perhaps related to the fact that the students used in this study exhibited a marked aversion to the clerical and some computational occupational areas (Table XVII, Col. 3). Why the three hundred normal individuals so rejected the Social Service area is inexplicable; however, one can conjecture that if the evidence at hand be reliable, contrary to common interpretation the average college student is not too strongly motivated by altruistic or humanitarian drives. At least one may so conjecture about the 503 cases we have under consideration.

In Table XVIII one sees that the low scores on the Kuder for the maladjusted group were significant for a greater number of cases in the Mechanical, Scientific, and Computational areas than for the normal groups. These differences were all significant at the 1 percent level. The maladjusted group had a smaller percent of cases with significantly low scores in the Social Service and Literary areas than had the normal group. The difference between the groups in the Social Service area was significant at the 1 percent level and in the Literary area at the 5 percent level.

TABLE XVIII

NUMBER OF CASES REACHING THE 25th PERCENTILE OR LESS IN THE RESPECTIVE GENERAL AREAS OF THE KUDER PREFERENCE RECORD

Interest Areas	Normal		Maladjusted		Differences of Percents[1]	Fisher t
	Number	Percent	Number	Percent		
Mechanical	70	23.3	79	38.8	15.5	3.74**
Computational	91	30.3	84	41.5	11.2	2.59**
Scientific	59	19.7	63	31.0	11.3	2.90**
Persuasive	76	25.3	48	26.6	1.3	0.43
Artistic	63	21.0	34	16.8	- 5.8	1.17
Literary	74	24.7	35	17.3	- 7.4	1.98*
Musical	36	12.0	16	7.9	- 4.1	1.48
Social Service	112	37.3	19	9.3	- 28.0	7.03**
Clerical	123	41.0	83	41.0	0.0	0.00

[1] Based upon the normal group

* Significant at the 5 percent level

** Significant at the 1 percent level

From the foregoing evidence, it would seem that the members of the maladjusted group seek to avoid associating with anything of an exact nature, such as mechanics, science, and computation. In the over-all similarity of these three fields, one may see why a group which is more closely associated with art, literature, and music would tend to reject mechanics, science, and computation.

Now let us look at the separate interest areas of the Kuder in detail (Table XVII). Though the determination of why individuals have certain scores on the various interest areas does not fall within the scope of this study, suggested causes may be advanced here and there.

Mechanical area.- Here a difference significant at the 1 percent level, was found between the normal and maladjusted groups that had scores below the 25th percentile. A smaller proportion of normal individuals had low scores on this scale. Obviously normal individuals found fewer of the items on the Mechanical scale distasteful. That a greater percent of maladjusted than of normal individuals had scores below the 25th percentile indicates that the maladjusted were less apt to prefer the mechanical occupations as classified by Kuder.

Computational area.- A greater percentage, also significant at the 1 percent level, of maladjusted than of normal individuals had scores below the 25th percentile on

the Computational scale. The fact that 30.3 percent of the normal group and 41.5 percent of the maladjusted had low scores on this scale may reflect the select college population used as the basis of this study. It would not be likely that these college students would be interested in the occupations Kuder has identified with the computational scale such as "Calculating Machine operation,... Statistical clerk ... Surveyor."[1] That a greater percent of maladjusted individuals reject the area may be symptomatic of their maladjustment owing to the routine, conservative type of activity associated with these occupations. Since evidence is lacking, one can only conjecture, however.

Scientific area.- In this area a greater proportion of maladjusted than of normal individuals had scores below the 25th percentile on the Scientific scale. Again the difference is significant at the 1 percent level of confidence. One might point out that the Mechanical and Scientific areas could be expected to be somewhat similar and that the maladjusted group consistently rejected both areas. It was found (Table VI, p.74) that these two areas were more preferred by the normal group than by the maladjusted; i.e., the normal group had a significantly higher percent of scores above the 75th percentile.

Persuasive area.- About 25 percent had scores below

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[1] G. Frederic Kuder, Revised Manual for the Kuder Preference Record. Chicago: Science Research Associates, 1946, p. 5.

the 25th percentile and no significant difference of percents was found between the normal and maladjusted groups in this instance.

Artistic area.- On the Artistic scale the number of scores below the 25th percentile was not significantly different for the normal and maladjusted groups.

Literary area.- A greater percent of normal than maladjusted persons had low scores on the Literary scale. It was also found (Table VI, p. 74) that a significantly greater percent of maladjusted individuals preferred this area.

Musical area.- The present data do not warrant making a distinction between the normal and maladjusted individuals who had low scores on the Musical scale.

Social Service area.- The greatest difference was noted between the normal and the maladjusted individuals who had scores below the 25th percentile - a difference of 28 percent. Normal persons had the greater percentage of low scores, namely, 37.3 as contrasted with 9.3 for the maladjusted subjects. The Fisher *t* of 7.3 makes this difference significant at the 1 percent level. Though the maladjusted groups did not have a much greater percentage with high scores on the Social Service scale (Table VI, p. 74), the maladjusted group did not reject the area as did the normal.

Clerical area.- Although 41 percent of both the normal and maladjusted groups had scores on the Clerical scale

below the 25th percentile, no statistical distinction can be made between them. That such a large number should reject this area may be related to the fact that the data originated with a college group, but the reasons for rejection may vary greatly between the two divisions with which we are dealing. One cannot tell from the evidence at hand.

To study the constituents of the various Kuder occupational groups, it was necessary to analyze the various groups separately. Table VI presents a comparison of high scores on the Kuder; Table XIX further analyzes these data. It should be recalled that Kuder established the 75th percentile as a cutting point for his test. In the subsequent analyses of Table XIX only the larger percents will be considered.

Of the M group, which, it will be remembered, is composed of the 203 maladjusted individuals who had T-scores of 70 or more on one or more of the diagnositc scales on the Multiphasic, thirty-one, or 15.3 percent, showed an interest in the Mechanical area. Of these, the larger groups were found to have T-scores above 70 on two scales. Almost one-half (41.9 percent) of these individuals had significant scores on the Depression scale of the Multiphasic and over a third (35.5 percent) on the Hypomania scale (Table XIX, p, 107, Col.2).

Forty-four, or 21.7 percent, of the M group scored high on the Computational area (Table XIX, p. 107). Of these over one-half (52.2 percent) scored high on the Depression

TABLE XIX

EXTENT TO WHICH THOSE WHO WERE SIGNIFICANTLY HIGH IN CERTAIN INTEREST AREAS WERE ALSO SIGNIFICANTLY HIGH IN CERTAIN DIAGNOSTIC GROUPS

Diagnostic Groups	Kuder Interest Areas								
	Mechanical			Computational			Scientific		
	Percent of 31 cases			Percent of 44 cases			Percent of 43 cases		
	M	M_1	M_2	M	M_1	M_2	M	M_1	M_2
Hypochondriasis	12.9	00.0	12.9	9.0	00.0	9.0	2.3	00.0	2.3
Depression	41.9	16.1	25.8	52.2	15.9	36.3	53.4	16.2	37.2
Hysteria	16.1	9.7	6.4	22.7	9.1	13.6	13.9	2.3	11.6
Psychopathic Deviate	9.7	00.0	9.7	11.4	00.0	11.4	18.6	2.3	16.2
Interest	29.0	16.1	12.9	38.7	20.5	18.2	60.3	27.8	32.5
Paranoia	12.9	3.2	9.7	13.6	00.0	13.6	13.9	2.3	11.6
Psychasthenia	19.3	3.2	16.1	9.1	00.0	9.1	25.5	4.6	20.9
Schizophrenia	9.7	00.0	9.7	18.2	4.5	13.6	16.2	2.3	13.9
Hypomania	35.5	16.1	19.3	18.2	9.1	9.1	16.2	7.0	9.2
"Lie" Score	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0
"Validity" Score	12.9	3.2	9.7	9.0	00.0	9.0	16.2	2.3	13.9

TABLE XIX (Continued)

Diagnostic Groups	Kuder Interest Areas								
	Persuasive			Artistic			Literary		
	Percent of 61 cases			Percent of 87 cases			Percent of 97 cases		
	M	M_1	M_2	M	M_1	M_2	M	M_1	M_2
Hypochondriasis	11.5	00.0	11.5	6.9	00.0	6.9	6.2	1.0	5.2
Depression	34.4	11.5	22.9	43.7	10.3	33.4	29.9	2.1	27.8
Hysteria	21.3	1.6	19.7	16.1	3.4	12.7	17.5	2.1	15.4
Psychopathic Deviate	22.9	1.6	21.3	21.8	2.3	19.5	22.7	00.0	22.7
Interest	39.4	19.7	19.7	49.4	25.3	24.1	36.0	9.2	26.8
Paranoia	8.1	1.6	6.5	5.7	00.0	5.7	8.2	00.0	8.2
Psychasthenia	16.4	00.0	16.4	21.8	1.1	20.7	14.4	00.0	14.4
Schizophrenia	29.5	00.0	29.5	13.8	00.0	13.8	14.4	00.0	14.4
Hypomania	21.3	4.9	16.4	21.8	8.0	13.8	18.5	4.1	14.4
"Lie" Score	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0	00.0
"Validity" Score	6.5	1.6	4.9	4.6	00.0	4.6	8.2	00.0	8.2

TABLE XIX (Continued)

Diagnostic Groups	Kuder Interest Areas								
	Musical			Social Service			Clerical		
	Percent of 112 cases			Percent of 49 cases			Percent of 36 cases		
	M	M_1	M_2	M	M_1	M_2	M	M_1	M_2
Hypochondriasis	4.4	00.0	4.4	8.1	2.0	6.1	11.0	00.0	11.0
Depression	36.5	5.3	31.2	57.1	22.4	34.7	55.4	19.4	36.0
Hysteria	13.4	0.9	12.5	20.4	6.1	16.3	11.0	00.0	11.0
Psychopathic Deviate	21.4	1.8	19.6	20.4	2.0	18.4	13.8	00.0	13.8
Interest	60.5	32.0	28.5	51.0	30.6	20.4	44.2	19.4	24.8
Paranoia	8.0	0.9	7.1	0.1	2.0	4.1	5.5	00.0	5.5
Psychasthenia	19.6	00.0	19.6	22.4	2.0	20.4	19.4	00.0	19.4
Schizophrenia	15.1	00.0	15.1	10.2	00.0	10.2	19.4	00.0	19.4
Hypomania	25.8	10.7	15.1	32.6	18.4	14.2	24.8	16.6	8.2
"Lie" Score	00.9	00.0	00.9	2.0	00.0	2.0	00.0	00.0	00.0
"Validity" Score	7.1	0.9	6.2	6.1	2.0	4.1	5.5	00.0	5.5

scale and some 38.7 percent on the Interest scale. It should be kept in mind that this is a preliminary scale and it should be noted that only 18.2 percent of the M_2 group (Table XIX, p. 107, Col. 7), the group the Multiphasic authors would consider to be seriously maladjusted as they had two or more T-scores above 70, were in this category.

It will be seen in Table XIX, p. 107 that forty-three individuals, or 21.2 percent of the M group, scored high on the Scientific scale. Of the forty-three cases that had high scores on the Interest scale, 32.5 percent were in the M_2 group. Since 60.3 percent of the forty-three cases in question had high scores on the Interest scale, apparently there is a definite tendency for individuals who have high scores on the Scientific scale of the Kuder also to have high scores on the Interest scale of the Multiphasic. Of these individuals who had high Scientific scores, 53.4 percent had high scores on the Depression scale as well and 37.2 percent (Col. 10) were in group M_2. Thus it seems to the writer that individuals having behavior problems with high scores on the Scientific scale are likely to have personality difficulties similar to those among individuals who are classified by the Multiphasic as depressed, or sexual interest deviates.

Sixty-one, or 30 percent of the M group had high scores on the Persuasive scale of the Kuder. On page 108, Column 2, it can be seen that those who comprised this 30 percent were distributed over the various areas of the Multiphasic within a range of 31.3 percent, the Interest scale with 39.4 percent and the Paranoia scale with 8.1 percent representing the extremes of the range.

A little over one-third had high scores on the Interest scale and on the Depression scale. Of the M group, 29.5 percent had T-scores of 70 or above on the Schizophrenia scale and all of these persons were in the M_2 group. Of the maladjusted individuals who did have significant scores on the Persuasive scale, over one-fourth also had high scores on the Schizophrenia scale, and because all of these same individuals were in the M_2 group, they would be considered seriously abnormal according to Multiphasic standards as previously explained in Chapter II.

Of the eighty-seven cases, or 42.9 percent of the M group with high scores on the Artistic scale, about one-half, 49.4 percent to be exact (Table XIX, p. 108, Col. 5) had high scores on the Interest scale as well. Of the M group, 43.7 percent had significantly high scores on the Depression scale. The writer feels that this is perhaps to be expected as the activities related to the Artistic area might be used either as compensation or a partial solution of the state of depression.

Of the M group, ninety-seven, or 47.7 percent, had high scores on the Literary scale. As indicated in Col. 8, p. 108 one finds that individuals with T-scores of 70 or above on the Multiphasic were distributed over all the diagnostic scales of the Multiphasic, with a few more on the Interest and Depression scales than on the others - 36 percent on the Interest, and 29.9 percent on the Depression scale to be exact. The Hypochondriosis and Paronoia scales represent the other extreme with 6.2 and 8.2 percent, respectively.

On the Musical scale, 112 or 55.1 percent of the M group had significant scores and of this number over one-half (60.5 percent) had high scores on the Interest scale. Table XIX, p.109. Cols. 2, 3, and 4 respectively, shows that this 60.5 percent was divided nearly evenly with [illegible] in the M_1 group and 28.5 perc[illegible] viduals with score on expect ely not er of high Multi- ad high test scales 51 percent igher gh who o had he second , had high scores on [illegible], p. 109).

Table XX further analyzes the data from Table IV by separating all the cases that show significant scores on each

TABLE XX

EXTENT TO WHICH THOSE WHO WERE SIGNIFICANTLY HIGH IN CERTAIN DIAGNOSTIC GROUPS WERE ALSO SIGNIFICANTLY HIGH IN CERTAIN INTEREST AREAS

Diagnostic Group	Total number of cases	Kuder Interest Areas								
		Mechanical			Computational			Scientific		
		M Pct.	M_1 Pct.	M_2 Pct.	M Pct.	M_1 Pct.	M_2 Pct.	M Pct.	M_1 Pct.	M_2 Pct.
Hypochondriasis	12	33.3	00.0	33.3	33.3	00.0	33.3	8.3	00.0	8.3
Depression	87	14.9	5.7	9.2	26.4	8.0	18.4	26.4	8.0	18.4
Hysteria	36	13.8	8.3	5.5	27.7	11.1	16.6	16.6	2.8	13.8
Psychopathic Deviate	42	7.1	00.0	7.1	11.9	00.0	11.9	19.0	2.4	16.6
Interest	94	9.5	5.3	4.2	18.0	9.5	8.5	27.6	12.7	14.9
Paranoia	17	23.5	5.9	17.6	35.3	00.0	35.3	35.3	5.9	29.4
Psychasthenia	42	14.3	2.4	11.9	9.6	00.0	9.6	26.2	4.8	21.4
Schizophrenia	32	9.4	00.0	9.4	25.9	6.2	19.7	22.8	3.1	19.7
Hypomania	53	20.7	9.4	11.3	15.0	7.5	7.5	13.2	5.7	7.5
"Validity" Score	17	23.6	5.9	17.7	23.6	00.0	23.6	41.3	5.9	35.4

TABLE XX (Continued)

Diagnostic Group	Total number of cases	Kuder Interest Areas								
		Persuasive			Artistic			Literary		
		M Pct.	M_1 Pct.	M_2 Pct.	M Pct.	M_1 Pct.	M_2 Pct.	M Pct.	M_1 Pct.	M_2 Pct.
Hypochondriasis	12	58.0	00.0	58.0	50.0	00.0	50.0	50.0	8.3	41.7
Depression	87	24.1	8.0	16.1	43.7	10.4	33.3	33.3	2.3	31.0
Hysteria	36	36.0	2.8	33.2	38.8	8.3	30.5	47.1	5.5	41.6
Psychopathic Deviate	42	33.3	2.4	30.9	45.2	4.8	40.4	52.4	00.0	52.4
Interest	94	25.4	12.7	12.7	45.6	23.3	22.3	37.1	9.5	27.6
Paranoia	17	29.4	5.9	23.5	29.4	00.0	29.4	47.0	00.0	47.0
Psychasthenia	42	23.8	00.0	23.8	45.2	2.4	42.8	33.3	00.0	33.3
Schizophrenia	32	57.2	00.0	57.2	37.4	00.0	37.4	43.7	00.0	43.7
Hypomania	53	24.5	5.7	18.8	35.9	13.2	22.7	33.9	7.5	22.6
"Validity" Score	17	23.6	5.9	17.7	23.6	00.0	23.6	47.2	00.0	47.2

TABLE XX (Continued)

Diagnostic Group	Total number of cases	Kuder Interest Areas								
		Musical			Social Service			Clerical		
		M Pct.	M_1 Pct.	M_2 Pct.	M Pct.	M_1 Pct.	M_2 Pct.	M Pct.	M_1 Pct.	M_2 Pct.
Hypochondriasis	12	41.7	00.0	41.7	33.3	8.3	25.0	33.3	00.0	33.3
Depression	87	47.1	6.9	40.2	32.2	12.7	19.5	23.0	8.0	15.0
Hysteria	36	41.6	2.8	38.8	27.7	5.5	22.2	11.1	00.0	11.1
Psychopathic Deviate	42	57.2	4.8	52.4	23.8	2.4	21.4	11.9	00.0	11.9
Interest	94	72.1	38.2	33.9	26.5	15.9	10.6	17.0	7.4	9.6
Paranoia	17	52.9	5.9	47.0	17.6	5.9	11.7	11.7	00.0	11.7
Psychasthenia	42	52.4	00.0	52.4	26.2	2.4	23.8	16.7	00.0	16.7
Schizophrenia	32	53.0	00.0	53.0	16.6	00.0	16.6	22.8	00.0	22.8
Hypomania	53	54.7	22.6	32.1	30.2	17.0	13.2	17.0	11.3	5.7
"Validity" Score	17	47.2	5.9	41.3	17.7	5.9	11.8	11.8	00.0	11.8

of the scales of the Multiphasic and then studying them for each scale for evidence as to how the diagnostic type has shown interests on the Kuder. Only the largest percents for each diagnostic group will be [illegible]

[illegible] group that
we [illegible] showed
s[illegible] Kuder, and
one [illegible] scales; to
be [illegible] the Ar-
tist [illegible], Cols. 3,
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42.9 [illegible] Depression
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[illegible] the M group, thirty-six, or 17.7 percent, had significantly high scores on the Hysteria scale. This comparitively small group had the most cases with high scores on the

Literary (47.1 percent), Musical (41.6 percent) and Artistic (38.8 percent) scales (Table XX, Col. 9, p. 114; Col. 3, p. 115 and Col. 3, p. 114 respectively).

Forty-two cases, or 20.7 percent of the M group, had high scores on the Psychopathic-Deviate scale. As shown in Table XX, Col. 2, p. 115 and Col. 9, p. 114, over one-half of these forty-two cases also had high scores on the Musical (57.2 percent) and on the Literary (52.4 percent) scales.

On the Interest scale, ninety-four, or 46.3 percent, of the M group had significant scores; of these, 72.1 percent also had high scores on the Musical scale. The Musical scale had the greatest percent of cases also if one uses the M_1 or M_2 group as a basis of computation. One finds (Table XX, Cols. 3, 4, and 5, p. 115) that this 72.1 percent is nearly evenly divided, with 38.2 percent falling in the M_1 group and 33.9 in the M_2 group. So it seems to the writer that individuals with high scores on the Interest scale of the Multiphasic are more likely to have high scores on the Musical scale of the Kuder than on any of Kuder's other scales.

Next to the smallest number of cases for any one scale was tabulated for the Paranoia scale; seventeen, or 8.4 percent, of the M group had significant scores on this scale. Over one-half (52.9 percent) of these also had high scores on the Musical scale (Table XX, Col. 3, p. 115).

Forty-two, or 20.7 percent of the M group, had high scores on Psychasthenia and 52.4 of them had high scores as well on the Musical scale. On Artistic, 45.2 percent also had high scores (Table XX, Col. 6, p. 114).

In regard to Schizophrenia, only thirty-two, or 15.8 percent of the M group, had high scores; of these 57.2 percent were high on the Persuasive scale (Table XX, Col. 3, p. 114), 53 percent on the Musical scale (Table XX, Col. 3, p. 115), and 43.7 percent on the Literary scale (Table XX, Col. 9, p. 114). All three of these percents were established by the M_2 group. It should be noted that nearly all of the individuals who had T-scores of 70 or over on the Schizophrenia scale also fell in the M_2 groups. The exceptions occur in the Computational and Scientific areas where the M_1 group accounts for 6.2 and 3.1 percent respectively. Apparently the Schizophrenia scale "picks up" the seriously abnormal individuals. It seems to the writer that the high percent of cases having both high scores on both the Persuasive and Schizophrenia scales confirms his observation that people with schizoid tendencies often have many characteristics in common with those who exhibit tendencies often attributed to persons in occupations related to persuasiveness.

Fifty-three, or 26.1 percent, of the M group had high scores on the Hypomania scale of the Multiphasic. Over one-half of these, 54.7 percent to be exact, also have high scores on the Musical scale (Table XX, Col. 3, p. 115).

Of the M group, seventeen (8.4 percent) cases had significantly high scores on the Validity scale of the Multiphasic.

These were relatively evenly spread over the nine areas of the Kuder. The Literary, Musical, and Scientific areas had a few more than the other six.

The foregoing data have been presented to show the relationships that were found between the Minnesota Multiphasic Personality Inventory and Kuder Preference Record when these tests were administered to 503 students at the University of Michigan with whom we have been dealing. The tabulations on the following page will help the reader visualize the most significant relationships between two variables: (1) the first three significant diagnoses of maladjustment as measured by the Minnesota Multiphasic Personality Inventory, and each of the nine interest areas as measured by the Kuder Preference Record; and (2) the first three significant Kuder areas of occupational interest and each of the nine Multiphasic diagnostic scales.

The tabulations just referred to are as follows:

THE FIRST THREE SIGNIFICANT DIAGNOSES OF MALADJUSTMENT ACCORDING TO THE MULTIPHASIC FOR EACH KUDER OCCUPATIONAL SCALE, LISTED IN ORDER OF FREQUENCY.

MECHANICAL	COMPUTATIONAL	SCIENTIFIC
Depression	Depression	Interest[1]
Hypomania	Interest[1]	Depression
Paranoia	Hysteria[1]	Psychasthenia
PERSUASIVE	**ARTISTIC**	**LITERARY**
Interest[1]	Interest[1]	Interest[1]
Depression	Depression	Depression
Schizophrenia[1]	Psychopathic-deviate	Psychopathic-deviate
MUSICAL	**SOCIAL SERVICE**	**CLERICAL**
Interest[1]	Depression	Depression
Depression	Interest[1]	Interest[1]
Hypomania	Hypomania	Hypomania

THE FIRST THREE SIGNIFICANT AREAS OF OCCUPATIONAL INTEREST ACCORDING TO THE KUDER FOR EACH OF THE MULTIPHASIC DIAGNOSTIC SCALES, LISTED IN ORDER OF FREQUENCY.

HYPOCHONDRIASIS	DEPRESSION	HYSTERIA[1]
Persuasive	Musical	Literary
Artistic	Artistic	Musical
Literary	Literary	Artistic
PSYCHOPATHIC-DEVIATE	**INTEREST[1]**	**PARANOIA**
Musical	Musical	Musical
Literary	Artistic	Literary
Artistic	Literary	Computational
PSYCHASTHENIA	**SCHIZOPHRENIA[1]**	**HYPOMANIA**
Musical	Persuasive	Musical
Artistic	Musical	Artistic
Literary	Literary	Literary

[1] Preliminary Scale

Chapter IV

SUMMARY OF FINDINGS AND SUGGESTIONS FOR FURTHER RESEARCH

The reader should recall that this study eventuated from certain observations which were made at the Bureau of Psychological Services at the University of Michigan; namely, that there were some relationships between the personality adjustment problems of the counselees and their vocational preference patterns. Therefore, the purpose of this study has been to determine the possible relation of personality adjustment to occupational interests.

Permission was granted by the Bureau of Psychological Services to use data from the case records compiled by the Bureau clinic. The results of the Minnesota Multiphasic Personality Inventory and the Kuder Preference Record, two of the tests which the Bureau employed, constitute the basis of the study.

But these tests have certain limitations which thus became limitations of this project. For instance, as was pointed out in Chapter II, the elusive qualities of personality and interest are difficult to measure and in the current literature concerning the two tests employed in this study it is evident that there is lack of agreement among authorities as to their validity. Several assumptions were proposed, to wit:

First assumption.- There is a determinable relationship between a person's personality adjustment and his occupational interests.

Second assumption.- A higher percentage of maladjusted individuals choose the Social Service, Artistic, Literary, and Musical areas on the Kuder Inventory than choose any of the other areas on that test.

Third assumption.- A higher percentage of [illegible] individuals than would normally be expected [illegible] high scores on the Social Service area of the Kuder.

Fourth assumption.- A higher percentage of [illegible] individuals than would normally be expected have [illegible] high scores on one or more of the three "cultural" areas of the Kuder, i.e., Artistic, Musical, Literary. The data were organized to test these ideas.

It was found that of the 503 cases studied, about three-fourths were veterans attending the University of Michigan under the provision of Public Law No. 346, and about one-fourth were non-veterans. The group used for this project was arbitrarily divided into "normal" and "maladjusted" sections by the use of the standards established for the Multiphasic; namely, individuals with T-scores of 70 or above were classified as "maladjusted" and all those with T-scores of less than 70, as "normal." Of the 503 cases in question, over 80 percent were men, of whom a similar proportion were

in the maladjusted group. According to the Multiphasic, about one-half of the maladjusted array would be considered seriously abnormal. On the Depression scale of the Multiphasic, almost one-half (42.9 percent) of the maladjusted [illegible] had significant scores, and on the preliminary [illegible] scale, 46 percent had scores indicating abnormal [illegible]. The scores of the maladjusted cases were dispersed [illegible] over the other scales of the Multiphasic with a [illegible] ded on the Hypomania, Psychopathic Deviate, and [illegible] scales than on the preliminary Schizophrenia, [illegible] liminary Hysteria and Hypochondriasis scales. [illegible] the significance of differences between the nor- [illegible] sted groups was studied it was found that the [illegible] significantly more individuals with high scores [illegible] al and Scientific scales of the Kuder and fewer [illegible] with significant scores on the Musical, Literary, [illegible] scales. These differences were all significant [illegible] nt level, except that for the Artistic scale [illegible] ificant at the 5 percent level. Obviously the [illegible] be true for the maladjusted group: i.e., more [illegible], Literary, and Artistic and fewer on the Scientific and Mechanical scales. The present data show no significant differences between the normal and maladjusted individuals who had significant scores on the Computational, Persuasive, Social Service, and Clerical scales. This does

not preclude a difference, but the evidence does not warrant the conclusion that one exists.

About one-third of all the cases in the project had two significant scores on the Kuder and one-third had three. Hence an evaluation of these combinations of interests indicates that one could say that a person with combined scores of Mechanical-Scientific, Mechanical-Persuasive, Mechanical-Musical, or Mechanical-Social Service would be more apt to be normal than maladjusted. While a person with Artistic-Literary, Literary-Musical, Artistic-Musical, or Literary-Clerical would be more apt to be maladjusted. From the present data, no significant prediction can be made for the other possible combinations of Kuder scores. By having significantly low scores on the Kuder, the maladjusted group indicated a marked lack of identification with the Mechanical, Computational, and Scientific areas as compared with the normal group who in turn had significantly more low acores in the Literary and Social Service areas. Thus it appears that normal individuals tend to reject the Social Service and Literary occupations as classified by Kuder, while the maladjusted reject the Mechanical, Computational and Scientific occupations.

ASSUMPTIONS

We shall now consider the <u>a priori</u> assumptions of this study in light of such supporting evidence as our procedures have brought forward.

The first assumption was that there is a determinable relationship between a person's personality adjustment and his occupational interests. The data related to this assumption may now be summarized as follows:

Students at the University of Michigan with personality maladjustments, i.e., those who have T-scores of 70 or more on any of the diagnostic scales on the Multiphasic, are more apt to have occupational interests which fall within the significant range (75th percentile or above) on the Kuder in the Literary, Musical, and Artistic areas than are those who have normal profiles on the Multiphasic. Moreover, these same maladjusted individuals are less apt than the normal ones to have interests in the Mechanical and Scientific areas. The separate and combined areas of occupational interest in which the normal and maladjusted individuals have been classified by the the Kuder are:

Normal	Maladjusted
Mechanical **	Literary **
Scientific **	Musical **
Mechanical-Scientific **	Artistic *
Mechanical-Persuasive *	Artistic-Literary **
Mechanical-Musical *	Literary-Musical **
Mechanical-Social Service *	Artistic-Musical *
	Literary-Clerical *

* Significant at the 5 percent level
** Significant at the 1 percent level

These represent the significant differences between the occupational interests of the normal and the maladjusted groups as we have employed them. In the other interest areas

there were no significant differences between the two (Tables VI, and VIII to XVI inclusive).

A second assumption was that a higher percentage of maladjusted individuals choose the Social Service, Artistic. Literary, and Musical areas on the Kuder Inventory than choose any of the other areas on that list. In this connection it was found that the significant differences between the [illegible] and maladjusted groups partially supported this idea. [illegible] chances that an individual would be maladjusted as [illegible] the Multiphasic were greater than that he would be [illegible] his occupational interests were Literary, Musical, [illegible] (Table VI, p. 74). However, no significant difference [illegible] found between normal and maladjusted persons who chose [illegible] Social Service areas of the Kuder (Table VI, p. 74).

The third assumption that a higher percentage [illegible] adjusted individuals than would normally be expected [illegible] nificantly high scores on the Social Service areas of the Kuder was found untenable, because no significant difference was discovered between the normal and maladjusted persons who had high scores in this area (Table VI, p. 74). This does not imply that the reasons suggested in Chapter II why individuals identify themselves with the Social Service areas may not be valid, but the present data do not allow further pursuit of them.

The fourth assumption that a higher percentage of maladjusted individuals than would normally be expected have

significantly high scores on one or more of the three "cultural" areas on the Kuder; i.e., Artistic, Musical, Literary, is supported. The chances are that a person with high scores in these areas will be maladjusted according to Multiphasic standards (Table VI, p. 74). Combinations of these cultural areas also indicated that an individual would be more likely to be maladjusted than to be normal. For example, significant scores on the combinations, Artistic-Literary, Literary-Musical, and Artistic-Musical (Table XII, p. 91 ; XIII, p 92) would mean that an individual is likely to be maladjusted. If a person "balanced" his high scores in the "cultural" area with a high score in another which was quite different, he might be more likely to be normal than maladjusted. The high scores in the combination of Mechanical-Musical areas would be a sign that a person is more likely to be normal (Table VIII, p. 85). No significant difference was found between the normal and maladjusted groups that had other combinations of "cultural" and unrelated areas.

SOME IMPLICATIONS OF THE STUDY

A significant relationship was found to exist between one's personality adjustment and his occupational interests. This has been summarized in the preceding chapter. The causes were not determinable from the data nor were they part of the present problem. That certain types of individuals tend toward certain occupational areas has been shown, and the

significance of this is suggested for further study.

The findings of this project should aid a counselor to develop a clinical feeling toward the probability that maladjusted individuals may enter or apply for admission to certain fields of study. For example, a counselor might have a greater expectation of maladjustment among students of music than among those who are interested in mechanical engineering. If the application for admission to a particular professional division of a university is the result of a person's occupational interest, a correlation with a score on the Multiphasic might be anticipated.

The Multiphasic does give a counselor an evaluation of a counselee's personality, and helps the counselor to understand the emotional stability of the individual with whom he is dealing. The data employed here indicate that a surprisingly large percent of the cases handled by the Bureau of Psychological Services was "abnormal" according to Multiphasic standards. Unless a counselor is aware of the relative normality of his client, the counselor might fail to evaluate critically the divergence and thus miss the seriousness of the problem at hand. In this fashion only surface difficulties might preoccupy the counselor when in reality they masked the real difficulty. Moreover, there is urgent need for information about the traumatic effect of various occupations on an individual. With such knowledge, a counselor will be

enabled to determine not only the relation of personality adjustment to occupational interests, but also the advisability of a person's entering a job in view of the effect the job may have on him.

The number of students who, according to the Multiphasic, were maladjusted and who used the services of the Bureau of Psychological Services while they functioned at least passably in society was relatively large. Therefore it would seem advisable to be aware of the perhaps temporary nature of their adjustment and to aid them to anticipate difficulties they may have after leaving the University and to make avenues of assistance available to them for subsequent use.

If one accepts Kuder's classification of occupations,[1] one can tell something about the personality adjustment of an individual by using the data in this study.

No doubt, the most exacting use to which this study can be put is in relating the two tests which were used as bases of the project. Any worker or organization that is using or contemplating using the Multiphasic and the Kuder in a test battery can now find the inter-relationships between the two that might well exist in a similar university situation.

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[1] G. Frederic Kuder, Revised Manual for the Kuder Preference Record. Chicago: Science Research Associates, 1946, p.5.

FURTHER RESEARCH

As this study progressed, several related problems emerged. For instance, the determination of the relation of personality adjustment to success in specific occupations occurred to the writer as being worthy of investigation. Here the predominant type of maladjustment would be the point of reference.

Furthermore, this study has shown that a connection exists between personality adjustment and certain occupational interests, but the cause is obscure. Thus another problem emerges which well might challenge the interest of an investigator.

Again, the question obtrudes into the present discussion, of why and to what extent certain occupations, or jobs, frequently exercise a traumatic effect upon a worker. This needs investigating.

Then, too, if persons with certain types of maladjustment tend toward certain occupational fields, the determination of the incidence of maladjustment among those registered in corresponding divisions of the university, or in individual colleges, would be worthwhile.

A study of mental patients and of college atudents with similar abnormal deviations on the Multiphasic would throw valuable light on Hathaway and McKinley's idea that many abnormal individuals escape special attention and continue

to function satisfactorily in society, because of great differences in environmental pressures. Here would be reflected the idea that certain university students are really abnormal, but that their abnormality is masked by college membership. The famous architect, Frank Lloyd Wright once said that all universities should be closed for at least ten years and then revived, if needed, but only in an entirely new form, because in their present state he considers them a symbol of decadence and corruption.

A long-time study of individuals in various occupational areas who were "normal" in college but who became "maladjusted" or involved in serious difficulty later in life might reveal information pertinent to such questions as these: Was the cause of a breakdown after a successful college career related in any way to the vocational guidance which the individual received in college? Was the maladjusted individual who avoided detection or difficulty in college able to continue successfully this psuedo-normality throughout post-college life?

Finally, the limited consideration which this report gives to the 503 cases with which it is concerned raises still another question; namely, Is there a relationship between the types of deviation which occur in such relatively large proportion of the college population here studied and the personalities of those who seek advanced education?

In conclusion, then, the foregoing proposals for further research are suggestive of the types of problems which this study has brought to light but which are ancillary to its main purpose. At this point the writer leaves them to other investigators whose interests in the field of personality research may parallel his own.

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