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## The Relationship Between Personality as Measured by the Minnesota Multiphasic Personality Inventory and Interest as Measured by the Kuder Preference Record

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THE RELATIONSHIP BETWEEN PERSONALITY AS MEASURED  
BY THE MINNESOTA MULTIPHASIC PERSONALITY  
INVENTORY AND INTEREST AS MEASURED BY  
THE KUDER PREFERENCE RECORD

by

Robert Glen Knudsen

A thesis submitted in partial fulfillment  
of the requirements for the degree

of

MASTER OF SCIENCE

in

Psychology

Approved:

UTAH STATE UNIVERSITY  
Logan, Utah

1965

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## CHAPTER I

### THE NATURE OF THE STUDY

#### Background of the Problem

Counselors frequently use batteries of psychological tests in helping students to select appropriate educational and occupational choices. The task of interpreting scores on a battery of tests to students is not at any time a simple undertaking. The trend toward emphasis on the importance of the relationship among the various scores in a battery of tests, has further complicated test interpretation.

Vocational choice theories suggest an interrelationship between vocational interests and personality characteristics. They further suggest that different educational majors and occupations require different types of vocational interest and personality characteristics. Two tests, The Minnesota Multiphasic Personality Inventory (hereafter referred to as the MMPI) and the Kuder Preference Record-Vocational (hereafter referred to as the Kuder), are frequently used to help students make educational and occupational choices.

To help counselors make better interpretations, a number of research studies, using the MMPI and Kuder to determine the relationship of measured interest to measured personality traits have been conducted. The results of these studies have tended to disagree. Some studies have found no significant relationships between the two variables; while others have found significant relationships. There have also

been many research studies, using the MMPI and Kuder, to determine personality and interest differences among the different college majors. These studies, too, have disagreed.

Because of these limitations, there appears to be a need for a more systematic and dependable method of establishing relationships among the MMPI and Kuder, and of interpreting the patterns which are formed by those relationships.

#### Statement of the Problem

The purpose of this study is to gain more insight into three basic problems: 1. Is there a relationship between personality as measured by the MMPI and vocational interest as measured by the Kuder? 2. If there is a relationship, what is it? 3. Is it possible to discriminate between groups that score high on the various interest scales of the Kuder by using personality traits as measured by the MMPI and vocational interests as measured by the Kuder?

To answer these three questions, the following hypotheses will be tested:

1. There is no relationship between personality as measured by the MMPI and interest as measured by the Kuder.
2. There will be no significant differences in personality traits as measured by the MMPI between the ten interest groups (subjects were put in the interest groups according to their highest ranked Kuder interest score).
3. There will be no significant differences in interests as measured by the Kuder between the ten interest groups.

### Justification of the Study

The study is justified for the following reasons:

1. In the previous studies, both the relationship and the discrimination studies, there have been conflicting results reported. Katzell (1961) and Super (1957), after reviewing these studies and others, felt that there was a need for more carefully designed studies for the assessing of personalities of different student groups.

2. In the relationship studies, with two exceptions (Sternberg, 1956; Triggs, 1947), a non-college population was used.

3. Most studies, relationship and discrimination, were done using male populations, Tyler (1962) states that there is a need to learn more about female interests.

4. There have never been any empirical discrimination studies done between the Kuder interest scales and the MMPI.



## CHAPTER II

## SURVEY OF THE LITERATURE

Theoretical Basis of RelationshipBetween Interest and Personality

Vocational choice theorists are not in agreement as to the relationship of vocational interest and personality, nor are they in agreement as to the importance these two variables have in making a vocational or educational choice. Many (Berdie, 1943; Darley and Hagenah, 1955; Bordin, 1943; Gaddes, 1960) feel that interest is part of personality. For example, Darley feels that measured interests and actual occupational choice "reflect personality and provide opportunities for fulfillment of personal needs and drives" (Darley, 1955, p. 188). Gaddes (1960), after summarizing the historical development of vocational interest theory and personality, concludes that researchers will eventually find interests to be a specific aspect of personality.

Both Roe (1957) and Holland (1958, 1959, 1961) have tried to differentiate and group occupations according to personality and interest characteristics. Roe's classification stresses mostly interests, but she does have one personality dimension, namely the degree of orientation toward persons or nonpersons.

Holland (1959) has grouped occupations in terms of personality characteristics, but interests are implied since he hypothesizes, from his empirical studies, that "vocational interests are personality" (1961, p. 83). In fact, Holland (1958) has used this hypothesis to devise the Vocational Preference Inventory, a personality test, which uses occupa-

tional titles for its content. Geist (1959), using the same hypothesis, has developed a projective personality and interest test which used pictures of men and women working at various occupations.

Super (1960) disagrees with all of the above theorists, stating it is an oversimplification to say that personality is the only determiner of interest. He feels that interests are determined by three factors: socio-economic status; intelligence and aptitude; personality and experience. Super (1953) does agree, however, that different occupations require a characteristic pattern of abilities, interests, and personality traits.

In summary, all would agree that, theoretically, interest and personality are somewhat related, and that these two variables are important in vocational preference and entry. The disagreement seems to be in the degree of relationship between the two variables, and the amount of weight that is placed on interest and personality, as far as vocational and educational choice is concerned.

#### Studies of Relationship Between Interest and Personality

As has been discussed in the previous section, Vocational interest theories suggest an interrelationship between interest and personality characteristics. A number of research studies have been conducted to determine the correctness of this hypothesis. The results of these studies have tended to disagree. Some studies (Alteneider, 1940; Berdie, 1955; Cottle, 1950; Daniels, 1949; Darley, 1941; Lough, 1947; Tyler, 1945) have found no significant relationships between measured interest and measured personality. Cottle (1950) for example, who administered the

Strong, Kuder, MMPI, and Bell to 400 male adult veterans, concluded that there was little relationship between personality and interest inventories, although the personality inventories were related and the interest inventories were related. Tyler (1945), who correlated the scores of the Minnesota Personality Inventory with scores of the Strong, could find no clear relationships between the two tests.

Other studies, some (Bursch, 1952; Brayfield, 1957; Feather, 1950; Leton, 1949; Sternberg, 1956; Triggs, 1947) correlating the Kuder with the MMPI and others (Armatas, 1962; Berdie, 1943; Crites, 1963; Kinnane, 1962; Klugman, 1950; Melton, 1956; Springob, 1963) doing related studies have found significant relationships. The results of these studies will be discussed in three subtopics: Kuder versus MMPI; Related Studies; Common agreements.

#### Kuder versus MMPI

The significant results of the correlational studies between the Kuder and the MMPI are summarized in Table 1.

It is noted that, even with the diverse samples and different measuring instruments, the eight different correlational studies agree in most cases. The Pd, Mf, and Si Scales seem to have the most significant correlations. The significant results for each of the Kuder scales will be discussed later in the chapter. Sternberg (1956), who did the latest correlation study, concludes that, even though there is a relationship between the Kuder and the MMPI, it would be foolish to conclude personality traits from the Kuder or vocational interests from the MMPI.

#### Related studies

There have been some studies done on the relationship of measured interest to other aspects of personality. Berdie (1943) studied rela-

Table 1. Significant correlational results using the MMPI and Kuder  
(two exceptions<sup>a</sup>)

Kuder	MMPI												
	L	F	K	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
Outdoor					-rB		+rSp	-rSp				+rSp	-rB -rSp
Mech						-rS	-rS	-rC	-rS		-rS		+rSp +rSp
							+rSp	-rS					
								-rT					
								-rSp					
Comp.						-rS	-rS	-rT				-rS	+rSp
								-rSp				-rSp	
S II <sup>b</sup>						-rS	-rS	-rS	-rS	+rT		-rS	+rT
							-rSp	-rC	-rT			-rSp	+rSp
								-rSp					
P IX <sup>b</sup>					-rS		+rL		-rC	-rS	-rC	+rL	-rT
							+fSp		+rSp	-rC		+rS	
												+rSp	
Art		+rSp		+rL	+rS		+rS	+rS			+rL	+rS	+rSp
										+rS			
Music		+rC		+rS			+rC	+rC	+rC		+rT		
							-rSp	+rS					
								+rSp					
Lit.						+rS	+rS	+rS	+rS				
								+rC					
SS IV <sup>b</sup>		+rSp		+rL	-rT	+rL	+rL				+rL	+rL	-rT
Cl				+rL	+rL	+rL	+rL	+rSp			+rT	+rT	
					+rT								

+ r Significant positive correlation  
- r Significant negative correlation

<sup>a</sup>rSp (Springob, 1962) Kuder vs CPI N=226 white H.S. Senior boys.

<sup>a</sup>rT (Tyler, 1945) Strong vs MMPI.

<sup>b</sup>Strong group keys.

rB (Brayfield, 1957) N=50 young farmers.

rC (Cottle, 1950) N=400 male adult veterans.

rL (Leton, 1949) N=five groups of non-disabled veterans.

rS (Sternberg, 1956) N=270 white male college students.

rT (Triggs, 1947) N=35 white college males.

tionships between the number of likes and dislikes checked on the Strong; the ACE; scores for moral, social adjustment and emotionality from the MMPI. He concluded that the extent of likes and dislikes is closely related to vocational interest. He found that people in occupations primarily involving personal relationships are characteristically acceptant, emotionally, of their surroundings, but people whose occupations are more concerned with things than people tend to show rejection of their surroundings and perhaps cynical disillusionments.

In an attempt to see if there was a relationship between vocational interest and motives, Crites (1963) administered, to 130 male undergraduates, the SVIB and a motivation test which measured the following seven motives: (a) Job Freedom--minimum supervision, self-direction; (b) System--order, things not people; (c) Behavior Control--control of people; (d) Social Service--helping people; (e) Personal Status--ego centered, narcissistic; (f) Structure--security that comes from doing routine tasks; (g) Material security--rewards of an extrinsic nature, e.g. commissions etc. Correlations were then run between these seven variables and the forty-five SVIB scales. The significant motives of the various groups were: Biological Science was positively correlated with System and Job Freedom, and negatively correlated with Personal Status and Behavior Control; Physical Science had the same negative and positive correlations as Biological Science with the addition of a negative correlation with the Social Service Motive; The Technical, Production Manager had positive correlations with System and Structure and negative with Social Service; The Social Welfare group had positive correlations with Social Service and Behavior Control and negative System motives; The Business Detail group was positively correlated with

personal Status; The Business Contact was the same as the Social Welfare group with the addition of positive motive of Personal Status, which tends to indicate that this group helps people for personal gain.

In order to test the hypothesis that there is a relationship between work values and inventoried interests, Kinnane (1962) tested 191 male college freshmen and sophomores with the SVIB and the Work Values Inventory (developed by Super). There were three work values that correlated highly with the inventoried interests. Orientation toward security-economic-material values was positively correlated with the Physical Science, Technical, and Business Detail groups and negatively correlated with the Biological Science, Social Service, and Library-Legal groups. Social-artistic (orientation towards people) was positively correlated with the Social Service, Business Contract, and Literary-Legal groups. Heuristic (orientation towards impersonal tasks) was positively correlated with Science (both Physical and Biological) and the Technical Groups.

The results of the three studies just reported and correlations reported, in Table 1 between similar groups on the Si scale of the MMPI, seem to correspond rather closely to the "Things versus People" bipolar factor identified by Thurstone (1931) and Strong (1943) in the factor analysis of the SVIB, which suggests that this "interest-personality" dimension may be a basic one along which occupations are differentiated.

#### Common agreements

Factors associated with high Aesthetic interests. There is considerable agreement (Darley, 1955; Feather, 1950; Forer, 1951; Klugman, 1950; Newman, 1955; Strauffacher, 1959; Sternberg, 1956; Trigg, 1957)

that individuals with artistic, musical, and literary interests tend to be more maladjusted, as indicated by test scores or ratings of judges, than those with scientific or mechanical interests. In a most recent study, (Drasgrow, 1964) psychiatric patients were given the Kuder Preference Record-Form C before and after therapy. The above mentioned scales decreased significantly after completion of "successful" therapy. Melton (1956), however, using the California Test of Personality and the Lee-Thorpe Occupational Interest Inventory found that individuals (a group of high school seniors) interested in the Personal-Social and the Arts were the best adjusted according to the personality test scores, while those interested in the Mechanical field were the most poorly adjusted. Patterson (21) proposes that the reason for this apparent disagreement, since the California Test of Personality has many items in the area of social adjustment, is that scientific or mechanical interests have been found to be related to lesser concern with people and social activities; while interest in literature and the arts have correlated positively with concern for people and social activities.

Sternberg (1956) suggests four possible reasons for the apparent maladjustment of those with high aesthetic interest. First, because of difficulty in conforming to society's patterns of behavior, they may feel left out. Second, people with aesthetic interest have a greater investment of emotion, therefore, the demand for satisfaction is more intense. Third, there seems to be a loss of self-esteem or feeling of rejection because society places little emphasis or value on aesthetic activities. Roe's (1957) well-adjusted artist had been accepted by society. Lastly, the lack of order, precision, definiteness might lead

to uncertainty and maladjustment.

Factors associated with high social service interest. The adjustment of individuals with social welfare interests seems to vary among different studies. In some (Darley, 1955; Melton, 1956; Triggs, 1947) persons with social service interests were in the better adjusted group. In Sternberg's study (1956), social welfare interests were not associated with adjustment as measured by the MMPI. In other studies, (Forer, 1951; Leton, 1949; Klugman, 1950; Newman, 1955) there were indications that the social welfare interest was associated with maladjustment. One reason for this difference, according to Patterson (1957), is the nature of the sample, in terms of differing motivations toward social service occupations. Those who may be interested in such work as a result of their own problems should appear to be maladjusted on a personality inventory.

In none of the studies cited was it stated or implied that those whose strongest interests were in scientific, mechanical or related activities were free from maladjustment. Indeed, there is much evidence of depressive tendencies and emotional constriction among scientists and technicians (Redlo, 1951; Roe, 1957).

The statements of Strong and Fowler appear to summarize studies on the relation of personality and interests in normal subjects. "Interests as measured today are related somewhat to certain personality factors and attitudes" (Strong, 1943, p. 341). "General agreement seems to exist, too, that interest test scores are not a dependable basis for conclusions about a clients attitudes and adjustment" (Fowler, 1945, p. 26). However, there does appear to be some relationship within the normal range between maladjustment and certain types of interests.



### Personality Discrimination of Groups

Many studies have been done on the discrimination of persons in various college majors and occupations, using personality or interest tests as the discriminating factor. Since choice of an occupation or college major represents a person's interests, the studies differentiating the personality and interest of these groups was also reviewed.

#### Using the MMPI

The studies done using the MMPI have yielded conflicting results. Various studies (Bier, 1948; Blum, 1947; Clark, 1953; Fassett, 1950; Harder, 1959; Lough, 1947) did not find any personality differences that would be useful in differentiating one group from another. Blum (1947) found that the greatest differences between the five groups of professional students was in their vocational and non-vocational interest tendencies rather than in personality traits. It is concluded by most authors in this group that the MMPI is not a useful instrument for differentiating between groups. Sternberg, (1953) who used the MMPI, Kuder, and the Allport-Vernon Study of Values to find differences in college majors, found personality differences, but the MMPI proved the least effective in discriminating between groups.

Other studies (Booth, 1958; Daniels, 1949; Guthrie, 1963; Norman, 1951; Miller, 1961; Rinne, 1953; Redlo, 1951; Snyder, 1955; Spiaggia, 1950; Sternberg, 1955) have found that certain scales significantly discriminate major groupings from the remainder of the students, and conclude that the MMPI is a fairly sensitive instrument for measuring personality differences in certain occupations. The significant results of these studies are listed in Table 2.

Table 2. Summary of the significant results using the MMPI to discriminate groups.

Study	Group	Sex	H	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
Clark	Outdoor	M&F					L					
Booth	Athletic	M					L					
Daniels	Coach	M					L			L.		
Clark	Mechan	M				L.	L					
Norman	Engr.	M			L.	L.	L.				L	L
Clark	Phy Sc	M&F					L.					
Norman	Math			H	L	L				L.	L	
	Chem											
	Phy											
Redlow	Engr.	M		H	Low on all other scales							
	Phy Sc											
Holland	Physics										L	
Clark	Bio Sc	M			L							
Clark	Pers.										H	
Daniels	Salesman	M				H				L		
Norman	Bus Ad	M		L		H						
Clark	Art	F					L			L		
Spiaggia	Art	M		H		H	H	H		H	H	
Clark	Music						H					
Norman	Art - Music	M			H	H	H			H	H	
Redlow		M&F			High on all scales							
Holland	Musician	M							H			L
Clark	Lit.	M&F					H					
Daniels	Author	M				H	H			H	H	
Clark	S.S.	M			H	H	H			H		
Daniels	S.S.	M				H	H.			L	H	
Guthrie	Peace Corps	M&F		L			M H		L			
Norman	Psy S.S.	M				H					H	
Miller	YMCA Worker	M							L			L
Clark	Psychol	M&F				H.	H					
Snyder	Psy students	M	L						L			
Daniels	Cl.	M				L.				H.	L.	
Holland	Account- ant	M				L					L	

H = Significantly higher mean score on this scale of MMPI.

H. = Had the highest mean score on this scale of MMPI.

L = Significantly lower mean score on this scale of MMPI.

L. = Had the lowest mean score on this scale of MMPI.

The summary of results indicate that the Pd, Mf, Sc, and Ma are the most useful scales of the MMPI to discriminate between the different interest groups. Although there are many different samples, some student groups, some groups actually in the occupations, the different studies agree with each other in all but one case (a high and low with the social service group and the Sc scale). These results seem to favor Darley's (1955) theory, that people choose different occupations because of personality differences, more than it favors an opposite theory, that occupations mold personalities. The results of these studies will also be discussed later in the chapter.

In summary, it appears that it is possible, although not always the case, to use the MMPI to discriminate between various college majors and occupations.

#### Using other personality measures

Holland (1959) has classified occupations into six categories, or modal orientations, according to their personality traits. In the past few years, he has tested (1963, 1961) the modal orientations to see if they exhibit the personality traits hypothesized. Generally, the results of these studies have been consistent with the traits hypothesized. In the following paragraphs the personality traits for the six categories will be given along with other studies which support or disagree with his theory.

Physical Activity. (outdoor and technical interests) The people in this group, according to Holland (1957), are aggressive; like masculine roles; tend to "act out problems;" they avoid verbal or interpersonal skills and are threatened by such relationships. Small

(1955) also found his mechanical group to be aggressive, and Darley's (1941) technical interest group was more masculine, less socially adept and mature.

Intellectuality. (Science and Engineering) This group was hypothesized to have anal characteristics; to think through problems; to avoid interpersonal activities. Korn (1962) found them to have a higher femininity score than a norm group.

Supportative. (Social Service Occupations) This group was found to be more feminine; to possess verbal and social skills; to avoid physical skills, and order skills; to be quite dominating. Others (David, 1962; Darley, 1941) have found this group to be dominating, controlling, aggressive, competitive, liberal, and slightly feminine.

Persuasive. This group of occupations was hypothesized to be quite masculine; more socially oriented; tend to avoid order; quite dominating. Darley (1941) and Small's (1955) studies both confirm the hypothesis.

Conformity. (Business Detail Occupations) This groups' personality traits consist of enjoyment of verbal and numerical activities; tend to avoid interpersonal and physical activities; have excessive self-control; accept cultural values, rules and regulations. In addition, this group has been found to be less socially inclined (Darley, 1941).

Esthetic (Art, Music, Literary) This group seems to avoid interpersonal and structured activities; they are individualistic; have less ego strength and self-control. This group was also found to be withdrawn, narcissistic, with tendencies toward maladjustment (Small, 1956; Sternberg, 1953).

Summary of Discrimination and  
Relationship Studies

Relationship of MMPI to vocational  
interest and choice

Even though the testing of the hypothesis that interest and personality variables are related has been analyzed by two different statistical methods (correlations and level of significance; which have been discussed in the past two sections) the results of the two types of methods show considerable agreement. In both studies the Pd, Mf, and Sc scales of the MMPI show a greater relationship to the Kuder interest scales, college majors and actual occupations than do other scales of the MMPI. Two more personality traits therefore seem to emerge from these studies, a conformity vs non-conformity differentiation, and a masculine vs feminine interest. The "working with things" group, seeming to be more conforming (except outdoor) and masculine (except clerical) the "person oriented" and aesthetic seeming to be more individualistic and feminine (with the exception of Persuasive). The studies (Crites, 1963; Holland, 1959) reported earlier in this chapter, which used different personality measurements than the MMPI, confirm these findings. Although it is surprising, in the discrimination studies, that the Social Introversion Scale did not differentiate the "things vs people" factor that was discussed earlier, this scale was not developed when most of the studies were conducted.

A study by Galinsky (1962) suggests that early parental relationships may have caused the difference in personalities. Using physicists and clinical psychologists as a dicotomy, the following hypotheses were tested and confirmed:

- (a) As children, clinical psychologists had more opportunity to be curious about interpersonal relations than did physicists.
- (b) During childhood clinical psychologists had closer and warmer relationships with their mothers than physicists did.
- (c) Physicists more than clinical psychologists took their fathers as identity models.
- (d) Physicists received more intellectual stimulation from their families than did clinical psychologists.
- (e) Discipline of physicists was rigid, stressed obedience, and was meted out by their fathers; while discipline of clinical psychologists was flexible, stressed appeal to feelings and was meted out by their mothers.

### Conclusions

Although most studies reviewed have found a relationship between measured interest, manifest interests, and measured personality traits, there have been some that have found no relationship. It has been suggested (Harder, 1959) that conflicting results were caused by the samples in most of the studies being too small, and it is theoretically possible, on a personality scale that has 60 items with a mean of 20, for three persons to get average scores without duplicating each other's responses. Thompson (1960) contends that there might be personality differences, but that current methods of measuring personality traits are rough and unreliable. He also suggests that there is considerable flexibility in jobs. This was confirmed in a study of Raylesberg (1949) who found that engineering was seen by some students as scientific, by others as materialistic, and by still others as a social welfare occupation. It has also been suggested (Nugent, 1960) that not considering

aptitudes, was a reason for the inconsistencies. Most conflicting studies were done before the K scale was added to some of the MMPI raw scores. The writer feels this may be a reason for the conflict.

In summary, Super's comment is appropriate:

In certain occupations, although apparently not in others, it is possible to construct a picture of the typical personality. These personality sketches are not sufficiently clear-cut to provide a scientific basis for occupational choice, but the role expectations of occupations appear to be such as to affect the ease with which a person achieves self-realization in an occupation. (Super, 1957, p. 290)

Others (Darley, 1955; Roe, 1956) concur, that although the evidence is not extensive, there seems to be no doubt that some specialized occupations, at least, do attract persons who resemble each other in some personality characteristics.

### Discrimination of Occupational and Interest

#### Groups Using Interest as the Criterion

Many studies (Bending, 1959; Berdie, 1955; Blum, 1947; Monague, 1961) using both personality and interest inventories to discriminate between occupational and interest groups, have found interest inventories to be a far better discriminator. Roe, (1957) as has been mentioned earlier, even characterized the occupational groups according to differences in interests. In the following paragraphs, Roe's interest classifications will be summarized along with other studies that are pertinent to that group.

#### Roe's interest classification

Outdoor group. This group has high mechanical abilities and interests; their artistic interests are low. Brody (1957), using the Kuder to differentiate professional foresters from men in general, found the

foresters to be significantly higher on outdoor interest and significantly lower on persuasive and clerical interests. Brayfield (1957), using the Kuder to differentiate satisfied farmers from unsatisfied farmers, found scientific interest positively correlated, and literary interest negatively correlated with satisfaction.

Technology. Mechanical interest are most important for this group; interest in personal interaction the lowest of any group; they have high masculine interest.

Science. This group has high intellectual interests and abilities; orientation away from people, except psychologist and anthropologists.

Business contact. This group has high persuasive and aesthetic interests; their orientation is towards persons, but the nature of the relationship is exploitative. A study by Crites (1964), reported earlier in the chapter, supports Roe's hypothesis about the nature of the relationship. Miner (1960), using the Kuder in a company appraisal program, found good supervisors to have higher Persuasive, Computational, Scientific, and Literary scores, and lower mean scores on the Outdoor, Mechanical and Clerical scales.

Service. The outstanding characteristic is that person interactions are the predominant interest; this interest is succorant and nurturant. They seem to have few intellectual or artistic interests. Phillippas (1962), studied a group of teachers and found them to have high social service interests and lower computational interests. Sutters (1961) seminarians, in conflict with Roe's characterization, had high Literary and Musical scores on the Kuder. They did, however, score high on the Social Service and low on the Mechanical, Computational, and Scientific scales.



Arts and Entertainment. Strongly feminine and narcissistic interests.

Organization. The clerical interests are most important; interests in personal relations can be submissive or dominant. This is in disagreement with Holland's (1951) theory.

### Interest tests as predictive devices

Berdie (1955), to determine if the aptitude, achievement, interest, or personality test best differentiated occupational and educational groups, administered a battery of tests to entering college freshmen. Ten years later correlations and analysis of variance were done on the test scores of those who graduated from the university. The rank order of effectiveness of differentiation and prediction was interest, achievement, and aptitude. Personality tests did not predict at all. Berdie concluded that differentiation and prediction of which kind of curriculum a student graduates from can best be done by an interest test. Montague (1961) in a factor analysis study, found that different curricular groups had different "basic interest" patterns.

### Observations from the Survey of the Literature

The following observations are made from the survey of the literature:

1. Vocational theorists agree that interest and personality are related to one another, and this relationship should be taken into account when making an educational or occupational choice.
2. Vocational theorists have suggested the following "Personality-Interest" factors which differentiate educational and occupational groups:
  - a. A things vs people factor.
  - b. A conformity vs non-conformity factor.
  - c. A masculine vs feminine factor.

3. Most empirical studies have confirmed the theorists' hypotheses.
4. Studies, using the MMPI and Kuder to test relationships between measured interest and measured personality, have yielded conflicting results.
5. The studies, between the MMPI and Kuder where relationships were found, infer the following factors:
  - a. The things vs people factor.
  - b. Those scoring high on the aesthetic scales of the Kuder tend to be more maladjusted (as measured by the MMPI).
6. Studies, using the MMPI to discriminate between different educational and vocational groups, have yielded conflicting results.
7. When the MMPI and Kuder relationship and discrimination studies were combined, the following factors were inferred:
  - a. A conformity vs non-conformity factor.
  - b. A masculine vs feminity factor.
  - c. The Pd, Mf, and Sc scales of the MMPI are most related to the Kuder interest scales.
8. Many studies have found measured interest to be a better predictor and discriminator of educational and occupational groups.

## CHAPTER III

### METHODS AND PROCEDURES

#### Selecting the Subjects

The subjects in this study were freshman students who were admitted to Brigham Young University and Utah State University fall quarter, 1959. The sample included only those who took the MMPI and Kuder during orientation week. The sample consisted of 163 male students and 103 female students from Utah State University, and 874 male students and 1044 female students from Brigham Young University, making a total of 2118 students for the study.

#### Characteristics of the Tests

The following tests were used in the study:

##### Minnesota Multiphasic Personality Inventory

The MMPI was originally developed "to assay those traits that are commonly characteristic of disabling psychological abnormality" (Hathaway, 1951, p. 2), but it is now considered a general personality test. The test provides ten "clinical scales,"<sup>1</sup> which include the following: Hypochondriasis, Depression, Hysteria, Psychopathic Deviate, Masculine-Femininity, Paranoid, Psychasthenia, Schizophrenia, Hypomania, and Social Introversion.

Because of the ease of faking and also to check on carelessness, misunderstanding, malingering, the MMPI has four validity scales; ?

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<sup>1</sup>The meaning of these scales will be discussed on pages 24-28.

score--the total number of items put in the Cannot Say category, F Scale, L scale, and K scale.

### Kuder Preference Record-Vocational

The Kuder's major purpose is to indicate relative interest in a small number of broad areas. The items in the Kuder are of the force-choice triad type, thus it is an ipsative and not a normative test. The test provides 10 interest scales plus a verification scale for detecting carelessness and failure to follow directions. The interest scales include: Outdoor, Mechanical, Computational, Scientific, Persuasive, Artistic, Literary, Musical, Social Service, and Clerical.

### Definitions of Groups

The sample was divided into ten groups according to their highest ranked interest as measured ipsatively by the Kuder. Katz (1962) found the ipsative interpretation to be the best method. The groups were as follows:<sup>1</sup>

1. Outdoor (O): This group consisted of those students who have a preference for work that keeps one outside most of the time, usually dealing with animals and growing things.

2. Mechanical (M): This group consisted of those students who prefer working with machines and tools.

3. Computational (C): This group consisted of those students who prefer working with numbers.

4. Scientific (S): This group consisted of those students who prefer discovering new facts and solving problems.

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<sup>1</sup> Taken from the Administrator's Manual Kuder Preference Record, Science Research Associates, Inc., Chicago, Ill.

5. Persuasive (P): This group consisted of those students who prefer meeting and dealing with people, and promoting projects or things to sell.
6. Artistic (A): This group consisted of those students who prefer doing creative work with one's hands. It is usually work that has "eye appeal" involving attractive design, color, and materials.
7. Literary (L): This group consisted of those students who prefer reading a variety of materials from news magazines to books on philosophy, and writing letters, poems, and stories.
8. Musical (Mu): This group consisted of those students who prefer going to concerts, playing instruments, singing, or reading about music and musicians.
9. Social Service (SS): This group consisted of those students who prefer helping people.
10. Clerical (Cl): This group consisted of those students who prefer office work that requires precision and accuracy.

#### Variables in the Study

In order to test the hypotheses listed earlier the following variables were considered:

L score: First introduced into the inventory as a basis for evaluating the general frankness with which subject were answering questions, the L scale now has a number of interpretative implications. A high score indicates the subject's tendency to cover up and deny undesirable personal

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<sup>1</sup>The information contained in this section was condensed from the MMPI Handbook, by W. G. Dahlstrom and G. S. Welsh, the Univ. of Minn. Press; Minn., 1960.

faults. This group has been found to be overly conventional, slow and tense, passive and insecure about themselves. Subjects found to have low L scores were seen as perceptive and socially responsive, self-reliant and independent.

F score: Gough (1955) found the low scoring subjects to be characterized as sincere, calm, dependable, honest, unpretentious persons. By contrast, the higher scoring subjects were seen as moody, opportunistic, talkative, and changeable. Some were rebellious and lacked conformity.

Hypochondriasis scale (Hy): Those who scored high on this scale were rated good-tempered, responsive, modest, frank, verbal and orderly. The low scoring were found to be alert and quick to adjust.

Depression scale (D): Those men and women that scored high on this scale were rated as shy and nonaggressive. They were also seen as conforming, conscientious, and responsible, but with a lack of confidence in their own abilities. Although they were respected by others, they tended to avoid becoming involved in things and to maintain a coldness and distance in their relationship with others. Low scores seem to reflect the exact opposite of the high scores; they were seen as aggressive, energetic, outspoken, self-seeking, talkative, and good socializers.

Hysteria (Hs): Sex difference have been reported on those who score high on this scale. The men were seen as mature, prone to worry, affectionate, verbal and individualistic; while the women prone to worry, frank, but immature and careless. Low scorers on this scale have not been well defined, except that they seem to be rather constricted, conventional, and controlled.

Psychopathic deviate scale (Pd): Those males who scored high on this scale were described as sociable, talkative and verbal, and indivi-

dualistic. Like the male, the high female is sociable and verbal, but in addition, she was described as assertive, emotional, and high-strung. The low scoring males appear to be less socially active, conventional and have narrow interests. The low scoring females, too, were described as conventional, but they also seem to be persevering and willing to accept suggestions.

Masculine-femininity scale (Mf): The high scoring males were characterized as sensitive and prone to worry, idealistic and peaceable, sociable and curious, and as having general aesthetic interests. High scores for women are the exact opposite; they have been described as adventurous, having physical strength and endurance, having masculine interests. The low scoring males were coarse, orderly and clear thinking, prefer action to contemplation, narrow interests, and unwilling to face troublesome situations. The low scoring females, on the other hand, were sensitive and responsive as well as modest, grateful and wise. It appears that a high Mf for males and low Mf for females are related, and that the same is true of a low male Mf and a high female Mf.

Paranoid scale (Pa): The males that scored high on this scale were rated as sensitive, emotional, and prone to worry. They were characterized as affectionate, generous and grateful. The high female was described as being emotional, softhearted and sensitive. The low scoring men were seen as having narrow interests, self-distrusting, and conscienceless. The women with low scores conventional, self-controlled, and mature.

Psychasthenia (Pt): The men that scored high on this scale were found to be dull, formal, and unemotional. They also appear to be immature and quarrelsome. The high scoring women were judged neat in appearance, but shy, poor socializers, lacking in ingenuity. The low

scoring men emphasized success and productive achievement as a means of gaining status or recognition. They were judged as self-seeking, but realistic and responsible. The low scoring women were seen as having high interests, alert, and self-confident.

Schizophrenia scale (Sc): The high scoring men were seen as somewhat withdrawn, prone to worry, verbal, with a wide range of interests and general aesthetic interests. The high female was seen as socially active, dissatisfied and peaceable. The low scoring males were submissive, and compliant, and in many ways overly accepting of authority. They were characterized as mild, timid, cautious, conservative and conventional. The low scoring females were described as friendly and alert.

Hypomania (Ma): The high scoring men seem to be very sociable, energetic and open. They were described as sociable in the sense of being forward, talkative and verbal, individualistic and impulsive. The high females were described as frank, courageous, and idealistic. The low scoring men were judged as cool, unassuming, and sincere; the low female characterized as being mature, balanced, orderly and practical.

Social Introversion (Si): The high scoring men were modest, lacked originality in solving problems, rigid in thought and action, overly controlled and inhibited. In their relations with others, they were seen as lacking poise and social presence, as becoming rattled and confused in a social situation. Perhaps as a consequence, these men were rated as cold and distant.

The high scoring women were described as shy, modest, and sensitive. Over and above this social submissiveness, there was evidence of emotional warmth. They were kind, affectionate, softhearted, sentimental. The low scoring men were seen as sociable in the sense of mixing well, exhibition-



istic, high intellectual ability, and were verbal and fluent. They also manipulated others in attempting to gain their own ends. The low scoring women were enthusiastic, talkative, assertive, and adventurous.

#### Gathering and Processing Data

The following procedures were used in gathering and processing the data:

1. The Minnesota Multiphasic Personality Inventory and the Kuder Preference Record-Vocational were given to entering Freshmen at Brigham Young University and Utah State University as part of orientation procedures during the week prior to registration.

2. The tests were scored by IBM process and all results were double checked. The same precautions were taken in recording the data.

3. The proper K values were added to the thirteen raw scores on the MMPI, the test publishers means and standard deviations were then used to convert the raw scores to T-scores. Separate male and female norms were used.

4. The Kuder raw scores for the ten interest scales were converted to T-scores using the samples means and standard deviations. Separate male and female norms were used.

5. The conversion from raw to standard scores in steps 3 and 4 was done on the IBM computer.

6. The student's ten Kuder scores were then ranked from highest to lowest.

7. All data used in this study was then quantified and coded for analysis by IBM processes.

8. The separate male and female samples were divided into ten

groups according to their highest ranked interest for the statistical analysis.

#### Statistical Methods Used

The present study attempted to determine (a) the relationship between interest and personality variables (b) significant differences between various interest groups on personality and interest variables (c) which variables best identify the ten interest groups. The following statistics were used:<sup>1</sup>

Analysis of Variance--This statistic is used to test the null hypothesis namely, the hypothesis that there are no significant differences among three or more groups. The null hypothesis can be refuted by means of an F test by demonstrating differences which cannot be explained by chance. It was used in this study to infer relationships and determine significant differences between the ten interest groups on the thirteen personality variables of the MMPI and the ten Kuder interest variables.

T-test--This statistic is used after the null hypothesis has been refuted by an Analysis of Variance F-test, to determine the significance of differences between any two means. It was used in this study to determine where the significant differences were among the means of the personality and interest variables for the ten interest groups.

#### Statistical Comparisons Made

To infer relationships and determine if significant differences existed between the ten interest groups on the personality and interest

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<sup>1</sup>See Garret, H. E., Statistics in Psychology and Education, Longmans, Green and Co: New York, for a more complete discussion.

variables, an Analysis of Variance was computed between the ten interest groups and the following variables: L score, F score, K score, Hysteria, Depression, Hypochondriasis, Psychopathic Deviate, Masculinity-femininity, Paranoid, Psychasthenia, Schizophrenia, Hypomania, Social Introversion, Outdoors, Mechanical, Computational, Scientific, Persuasive, Artistic, Literary, Musical, Social Service, Clerical. Male and female samples were considered separately.

To determine where the significant differences were among the means of the personality and interest variables (if the null hypothesis was refuted by analysis of variance F-test), the T-test was used to compare every group mean of a particular variable with every other group mean of the same variable. Male and female samples were considered separately.

## CHAPTER IV

## RESULTS AND DISCUSSION

Results

The results of this investigation are presented in tables on the following pages. Observations are made about the general significant results and the significant results of the personality and interest variables as they pertain to each interest group.

General significant results

The mean MMPI T-scores of the males and females on the various personality scales did not differ significantly from one another. They did, however, score higher on the K, Hy, Pd, Mf (males only), Pa, Pt, Sc, and Ma scales than Hathaway's (1955) norm group. These results are consistent with other university norm groups. (Table 4)

Table 3. Mean MMPI T-Scores

Total Males N=947							
	L	F	K	Hs	D	Hy	Pd
Mean	49.1	53.9	54.3	53.1	51.4	55.9	58.6
	Mf	Pa	Pt	Sc	Ma	Si	
Mean	57.9	56.4	58.9	58.0	56.1	50	
Total Females N=1058							
	L	F	K	Hs	D	Hy	Pd
Mean	50.8	52.7	55.9	51.6	50.1	55.9	57.8
	Mf	Pa	Pt	Sc	Ma	Si	
Mean	47.2	57.6	57.3	56.7	55.1	51.3	

The mean Kuder raw scores of the males is higher, on the O, M, C, and S scales, than the females. The females are higher than the males on the A, L, Mu, SS, and Cl scales. These results agree with both Roe's (1955) and Kuder's (1951) findings. The males scored higher on the S scale and lower on the M scale than Kuder's (1951) norm group. The females were higher on Mu and lower on Cl than the norm group. (Table 5)

Table 4. Mean Kuder Raw Scores

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Males N=947						
Mean	<u>V</u>	<u>O</u>	<u>M</u>	<u>C</u>	<u>S</u>	<u>P</u>
	39.7	42.8	40.4	28.5	45.0	36.3
S.D.	6.0	15.7	13.9	9.8	13.8	14.5
Mean	<u>A</u>	<u>L</u>	<u>M</u>	<u>SS</u>	<u>Cl</u>	
	24.5	17.8	14.5	38.5	45.2	
S.D.	10.6	8.0	6.9	14.2	13.8	
Female N=1057						
Mean	<u>V</u>	<u>O</u>	<u>M</u>	<u>C</u>	<u>S</u>	<u>P</u>
	40.2	32.9	22.0	20.8	30.8	34.9
S.D.	6.4	14.0	9.8	8.9	12.9	12.4
Mean	<u>A</u>	<u>L</u>	<u>Mu</u>	<u>SS</u>	<u>Cl</u>	
	29.7	19.6	18.6	51.0	51.8	
S.D.	10.6	8.4	7.1	14.8	17.6	

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The analysis of variance of the MMPI scales (Tables 6 and 7) indicate that significant differences exist among the ten interest groups on nine of the thirteen personality variables for the males, and seven of the thirteen for the females. For both males and females the Mf and Si scales were significant at the .01 level, and the Pd, Pa, and Sc were significant at the .05 level. In addition, the D scale (.01) L, F, and Pt scales (.05)

were significant for the males, and the Ma and Hy scales (.01), were significant for the females.

Table 5. Analysis of Variance MMPI Scales MALES

S.O.V.	DF		L	F	K	Hy	D	Hs
Group	9	MSS	143.5	109.4	30.8	52.7	309.2	32.3
W. grp.	946	MSS	63.4	59.1	80.2	77.4	106.0	64.7
F-test			2.26	1.85	.38	.68	1.93	5.08
Level of Significance			.05	.05	NS	NS	.01	NS

  

S.O.V.	DF		Pd	Mf	Pa	Pt	Sc	Ma	Si
Group	9	MSS	196.3	669.0	178.5	262.1	249.5	114.6	324.9
W. grp.	946	MSS	101.6	115.4	82.0	120.2	141.4	121.8	106.8
F-test			1.93	5.08	2.18	2.18	1.80	.94	3.04
Level of Significance			.05	.01	.05	.05	.05	NS	.01

S.O.V. = Source of Variance

Group = No. of group

W. grp. = Within group

MSS = Mean sum of squares

Table 6. Analysis of Variance MMPI Scales FEMALES

S.O.V.	DF		L	F	K	Hy	D	Hs
Group	9	MSS	32.5	65.3	69.1	156.7	97.0	93.2
W. Grp.	1057	MSS	66.0	49.5	73.6	58.7	81.2	67.6
F-test			.49	1.31	.94	2.67	1.19	1.38
Level of Significance			NS	NS	NS	.01	NS	NS

  

S.O.V.	DF		Pd	Mf	Pa	Pt	Sc	Ma	Si
Group	9	MSS	178.2	405.4	133.3	87.1	128.8	352.2	355.0
W. Grp.	1057	MSS	93.9	86.6	72.9	79.1	78.5	111.6	90.3
F-test			1.90	4.68	1.83	1.10	1.80	3.15	3.93
Level of Significance			.05	.01	.05	NS	.05	.01	.01

S.O.V. = Source of Variance

Group = No. of Group

W. Grp. = Within group

MSS = Mean sum of squares

The analysis of variance of the Kuder scales (Tables 7 and 8) show clearly that significant differences do exist among the ten interest groups, on all the interest variables, for both the males and females. The reason for the high F-ratios is due largely to the fact that the high interest group was included in each of the analysis of variances of the ten interest variables. Aside from this fact, significant differences still exist among the interests groups on all the interest variables, since there was a large number of significant t-tests (between interest groups) for each of the interest variables.

Table 7. Analysis of Variance Kuder Scales MALES

S.O.V.	DF		O	M	C	S	P	A
Group	9	MSS	5216	3820	3853	3370	3699	4420
W. Grp.	946	MSS	61.0	63.8	66.0	68.8	61.6	55.9
F-test			85.4	59.8	58.4	49.0	60.0	79.1
Level of Significance			.01	.01	.01	.01	.01	.01

  

S.O.V.	DF		L	Mu	SS	C1
Group	9	MSS	3031	2492	3446	3722
W. Grp.	946	MSS	69.5	77.5	65.0	67.5
F-test			43.6	32.1	53.0	55.2
Level of Significance			.01	.01	.01	.01

S.O.V. = Source of Variance

Group = No. of groups

W. Grp. = Within group

MSS = Mean sum of squares

Table 8. Analysis of Variance Kuder Scales FEMALES

S.O.V.	DF		O	M	C	S	P	A
Group	9	MSS	4666	2369	4756	4049	4698	3604
W. Grp.	1057	MSS	60.7	77.6	63.7	64.8	62.9	72.0
F-test			76.8	30.6	74.7	62.4	74.7	50.0
Level of Significance			.01	.01	.01	.01	.01	.01

  

S.O.V.	DF		L	Mu	SS	C1
Group	9	MSS	4750	2735	3010	4968
W. Grp.	1057	MSS	61.6	68.7	75.9	63.0
F-test			77.0	39.8	34.6	78.9
Level of Significance			.01	.01	.01	.01

S.O.V. = Sum of Variance  
 Group = No. of groups  
 W. Grp. = Within groups  
 MSS = Mean sum of squares

#### Significant differences between groups

The results of the T-tests for the ten interest groups on the MMPI scales is summarized in Tables 9 and 10; the T-tests for the Kuder is summarized in Tables 11 and 12. The significant results of the T-tests for the personality and interest variables are summarized as they pertain to each interest group. In summarizing, the term significantly higher is used when the interest groups mean T-score was significantly higher, as measured by T-tests at the .01 or .05 level of significance, than three or more other interest groups mean T-score. The term significantly lower is used when the interest groups mean T-score was significantly lower, as measured by T-tests at the .01 or .05 level of significance, than three or more other interest groups mean T-score. The term significantly higher or lower than all other groups is used when the interest groups mean T-score was significantly (.01 or .05 level of significance) higher or lower than the nine other interest groups mean T-scores.



Table 9. Summary of Significant T-tests MMPI MALES

Group	N	Kuder T-score	Variables												
			L	F	K	Hy	D	Hs	Pd	Mf	Pa	Pt	Sc	Ma	Si
O	139	66	-	-			+		L'' -5	" -4			+		+'6
M	100	63	-	L'' -3			-		+2	L'' -6		+	+		+
C	89	66	-	L'' -3			-		-	" -4	L'' -4	L'' -5	L'' -8		-
S	86	63	-	-			-		+	-4	-4	-	+		-
P	89	67	-	+			L'' -6		H'' +3	-	-	L'' -5	-		L'' -8
A	113	67	+	+2			+		+	H'' +4	+	-	-		-
L	73	66	L'' -2	+2			+		L'' -4	H'' +6	+	-	+		-
Mu	105	61	-	-			+		H'' +3	H'' +6	+	+	+		-
SS	90	66	H'' +8	+			+2		-	+	H'' +5	+	+		-
Cl	72	68	+	+2			H'' +9		-	-	-	H'' +4	+	+	H'' +7

+ mean T-score of this interest group above the total mean score of all interest groups combined.

- mean T-score of this interest group below the total mean score of all interest groups combined.

H This interest group had the highest mean T-score of the ten interest groups.

L This interest group had the lowest mean T-score of the ten interest groups.

' This interest group's mean T-score was significantly (.01 or .05 level) higher or lower than at least one other interest group's mean T-score.

" This interest group's mean T-score was significantly (.01 or .05 level) higher or lower than at least three other interest group's mean T-scores.

''' This interest group's mean T-score was significantly (.01 or .05 level) higher or lower than all other interest group's mean T-scores.

The numbers 2-8 indicate the numbers of significant T-tests at the .01 or .05 level for that variable.

Table 10. Summary of Significant T-tests MMPI FEMALES

Groups	N	Kuder													
		T-score	L	F	K	Hy	D	Hs	Pd	Mf	Pa	Pt	Sc	Ma	Si
O	96	67													
M	114	60													
C	86	69													
S	92	66													
P	110	67													
A	116	64													
L	126	66													
Mu	97	63													
SS	102	63													
C1	128	65													

+ mean T-score of this interest group above the total mean score of all interest groups combined.

- mean T-score of this interest group below the total mean score of all interest groups combined.

H This interest group had the highest mean T-score of the ten interest groups.

L This interest group had the lowest mean T-score of the ten interest groups.

' This interest group's mean T-score was significantly (.01 or .05 level) higher or lower than at least one other interest group's mean T-score.

" This interest group's mean T-score was significantly (.01 or .05 level) higher or lower than at least three other interest group's mean T-scores.

''' This interest group's mean T-score was significantly (.01 or .05 level) higher or lower than all other interest group's mean T-scores.

The numbers 2-8 indicate the numbers of significant T-tests at the .01 or .05 level for that variable.

Table 11. Summary of Significant T-tests Kuder MALES

Groups	Variables									
	O	M	C	S	P	A	L	Mu	SS	C1
		H'''		"	L''	"	"	"	'	L''
O		+8	-3	+6	-5	+5	-	-6	-	-5
	H''		"	"	"	H''	L'''	"	'	'
M	+6		+6	+6	-4	+5	-8	-4	-	-2
	"	"		H'''	'	"	'	"	'	H''
C	-3	+5		+8	-4	-3	-3	-3	-	+7
	"	"	"	"	"	"	'	L'''	"	'
S	+6	+6	+7		-4	-3	-	-8	+4	-2
	L''	L''		"		L''	'	"	H'''	"
P	-6	-5	-3	-4		-3	+3	+6	+7	+7
	"	"	"	"	"	"	'	'	'	"
A	+5	+5	-4	-5	+4		-	-2	-	-4
	"	"		'	"	"		H''		"
L	-3	-4	-3	-3	+5	-3		+6	-	+4
	"	L''	L''	L''	"	'	'		L'''	L''
Mu	-5	-5	-6	-6	-4	-	-		-8	-5
	"	"	"	'	'	L''	"	'		"
SS	-4	-4	-4	-3	-4	-3	+5	+4		-5
	"	"	H'''	'	H''		H''	'	'	
C1	-5	-4	+8	-3	+7	-	+5	-2	-	

+ mean T-score of this interest group above the total mean score of all interest groups combined.

- mean T-score of this interest group below the total mean score of all interest groups combined.

H This interest group had the highest mean T-score of the ten interest groups.

L This interest group had the lowest mean T-score of the ten interest groups.

' This interest group's mean T-score was significantly (.01 or .05 level) higher or lower than at least one other interest group's mean T-score.

" This interest group's mean T-score was significantly (.01 or .05 level) higher or lower than at least three other interest group's mean T-scores.

''' This interest group's mean T-score was significantly (.01 or .05 level) higher or lower than all other interest group's mean T-scores.

The numbers 2-8 indicate the numbers of significant T-tests at the .01 or .05 level for that variable.

Table 12. Summary of Significant T-tests Kuder FEMALES

Groups	Variables									
	O	M	C	S	P	A	L	Mu	SS	C1
		"	"	H'''	"	H'''				"
O		+5	-4	+8	-6	+8	-	-2	+	-7
			L''		L'	"	L''	L''	L''	L''
M	-		-4	-	-6	-3	-8	-8	-8	-7
		"		"	"					H'''
C	-2	+5		+7	-5	-2	-	-2	-2	+8
	H'''	H''	"		"			L''	H''	
S	+8	+7	+7		-6	-2	-2	-7	+7	-4
	L'''	"				"	H''	"	"	"
P	-8	-4	-2	-3		-3	+5	-2	+4	+7
	"	"			"					"
A	+6	+5	-2	-2	+4		-	-2	-2	-3
	"	L'''			H''			H'		
L	-5	-8	-2	-2	+5	-2		+2	-	-2
	"	"			"	"	H''			"
Mu	-5	-4	-2	-3	+4	+7	+5		-	-2
	"	"		"	"					"
SS	-4	-4	-2	+3	+4	-2	-2	-		-3
	"	"	H''	L''	"	L''				
C1	-6	-4	+7	-7	+4	-4	-2	-	-2	

+ mean T-score of this interest group above the total mean score of all interest groups combined.

- mean T-score of this interest group below the total mean score of all interest groups combined.

H This interest group had the highest mean T-score of the ten interest groups.

L This interest group had the lowest mean T-score of the ten interest groups.

' This interest group's mean T-score was significantly (.01 or .05 level) higher or lower than at least one other interest group's mean T-score.

" This interest group's mean T-score was significantly (.01 or .05 level) higher or lower than at least three other interest group's mean T-scores.

''' This interest group's mean T-score was significantly (.01 or .05 level) higher or lower than all other interest group's mean T-scores.

The numbers 2-8 indicate the numbers of significant T-tests at the .01 or .05 level for that variable.

Both male and female students with high outdoor interests had significantly higher mean T-scores (females ranked highest of the ten female groups) on the Si scale and had significantly lower mean T-scores on the Pd scale (males ranked lowest of the male group) on the MMPI. On the Kuder both groups mean T-scores were significantly higher on the M, S, and A scales. The males mean T-score was significantly higher than all other male groups on the M scale and their mean A scale score ranked the highest of the ten male groups. The female students mean T-scores on the S and A scales were significantly higher than all other female groups. Both groups C and Cl scale (males ranked lowest of the ten Male groups) scores were significantly lower. Female students with high outdoor interests had the lowest mean T-score of any other female interest group on the Ma scale of the MMPI. The male students mean T-scores were significantly lower on the Ma scale of the MMPI and the Mu scale of the Kuder.

The high scoring mechanical males mean T-score was significantly lower and the lowest ranked of any male group on the F and Mf scales. The females with high mechanical interests had a significantly higher mean T-score on the Mf scale of the MMPI. On the Kuder, the males scored significantly higher on the O, C, S, A, and Cl scales (O and A scores highest ranked of the male groups) while scoring significantly lower on the P, L (significantly lower than all other male groups), and Mu scales. In contrast, the females mean T-scores were lower than the mean scores for all female groups on every interest scale; the P and Cl scale scores were significantly lower, and the L, Mu, and SS scales were significantly lower than all other female interest groups.

In the computational interest group, both the male and female mean T-scores were below the total mean scores for their respective groups

(except a positive Si and positive significant Mf for females) on all scales of the MMPI. The males mean T-scores were significantly lower and lowest ranked of all male groups on the F, Mf (not lowest ranked), Pa, Pt, and Sc scales. The females Pd scale mean T-score was significantly lower and lowest ranked of all female interest groups. On the Kuder, both the male and females mean t-scores were similar on all scales. They scored significantly higher on the M, S (females higher than all other female groups), and Cl (the males and females were significantly higher than all other groups), and significantly lower on O and P. The males scored significantly lower on the A, L, Mu, and SS scales.

Male students with a preference for Scientific activities showed significantly lower mean Mf and Pa (lowest ranked of male groups) T-scores on the MMPI. There were no significant MMPI scores for the females. On the Kuder, the male and female interest patterns were the same. Both scored significantly higher on the O, M, C, and SS. The females scored significantly higher than all other female groups on the O and ranked highest on the O, M and SS scales for the female groups. The males ranked highest on the C scale of the ten male groups. Both groups mean T-scores were significantly lower on the P and Mu scales. The males were significantly lower than all other male interest groups on the Mu scale, while the females were lowest ranked of all female groups on this same scale. In addition the males scored significantly lower on the A scale of the Kuder.

Males and Females with high persuasive interest were found to have significantly lower mean T-scores and ranked lowest of their respective interest groups on the Si scale of the MMPI. Females scored above the total mean of all female groups on the other scales of the MMPI, and significantly higher on the Pd scale and significantly higher than the nine

other female groups on the Ma scale. In addition to significantly scoring higher on the Pd scale, the males had significantly lower mean T-score and ranked lowest of the male groups on the D and Pt scales. On the Kuder, the males and females had similar interest patterns. Both groups were significantly higher on the L (females ranked highest of all female groups), SS (males significantly higher than all other groups) and Cl scales, and significantly lower on O (females mean T-score significantly lower than all other female groups), M, S, and A scales. The males mean T-score ranked lowest of all male groups on the O, M, and A scales.

Students with high Artistic interests showed higher mean T-scores on all MMPI scales except Sc, Ma, and Si. The males mean T-scores were significantly higher on the Pd and Mf scales. Having similar interest patterns on the Kuder (except the males mean T-scores were significantly lower while the females were significantly higher on the P scale), the male and female students mean T-scores were significantly higher on the O, and M scales and significantly lower on the Cl scale. The male students had significantly lower mean T-scores on the C and S scales.

Those students with high Literary interests showed high feminine interests on the MMPI. The males ranked highest of all male groups and had significantly higher mean T-scores, while the females ranked lowest of the ten female groups and had a significantly lower mean T-score on the Mf scale. They also had significantly higher mean T-scores on the Pa scale. The males had significantly lower mean T-scores on the Pd scale. The females had the highest ranked mean T-scores on the Sc scale. The male and female students had some similar interests on the Kuder, having mean T-scores significantly higher on the Mu scale and significantly lower scores on the O and M (lowest ranked of the female groups). The females mean T-score on the P scale was also significantly

higher. The males mean T-scores were significantly higher on the A and C1 scales and significantly lower on the C, S, and P scales.

As with the high Literary interest groups, the males and females with high Musical interests had significantly higher Mf scores on the MMPI. The males also had significantly higher mean T-scores on the Pd and Pa scales, while the female mean T-scores on the Si scale were significantly lower. The males mean T-scores for the nine other Kuder scales were all lower than the total mean scores for all groups combined and significantly lower on the M, C, S, P, SS, and C1 scales. They ranked lowest of all male groups on the M, C, S, SS, and C1 and significantly lower than all male groups on the SS scale. The females had significantly higher interest scores on the P, A, L, and C1 scales and significantly lower mean T-scores on the O, M, and S scales.

The high Social Service males mean T-scores were significantly higher and ranked highest of the other male groups on the L and Pa scales of the MMPI. They also had a significantly higher Mf score. The females mean T-score on the Hy scale was significantly higher than all other female groups. Both groups interest patterns were similar on some of the Kuder scales. They both had significantly higher mean T-scores on the P scale and significantly lower mean T-scores on the M and C1 scales. They also disagreed on other Kuder scales. The males mean T-scores were significantly higher on the L scale and significantly lower on the O, C, S, A, and Mu scales. The female mean T-scores were significantly higher on the S scale.

Male students with high Clerical interests had significantly higher mean T-scores on the D and P scales of the MMPI. On the D scale they scored significantly higher than all other male groups and had the highest



ranked mean T-score on the Pt scale. The females Hy and Si mean T-scores ranked lowest of the female groups and the Hy score was significantly lower. Both males and females mean T-scores ranked the highest in their respective groups and they were significantly higher on the Si scale of the MMPI. Their Kuder interest patterns were the same (a significantly higher L mean T-score for the males and a significantly lower A mean T-score for the females were the only exceptions). They both had significantly higher mean T-scores on the C (significantly higher than all other groups for male and highest ranked for females), and P scales (the males ranked lowest of any other male group) and significantly lower mean T-scores on the O, M, and S scales.

### Discussion

#### General

The results of the present study tend to correspond to earlier findings reported in the Survey of the Literature. The scales of the MMPI (Mf, Si, Pd, Pa, and Sc), which seem most related to the Kuder for both males and females in this study, all seem to have the following factors in common: masculine vs feminine interests, narrow vs wide range of interest, conformity vs non-conformity, non-verbal vs verbal, non-sociable vs sociable, and insensitive vs sensitive. In addition, the D, L, F, and Pt scales all have an aggressive vs passive factor which relates to the Kuder male groups and an aggressive vs passive factor (ma and Hy scales) which relates to the Kuder female groups. Because of the fairly low F-tests (although they were significant), with the exception of the Mf and Si, the only factors which differentiated most interest groups was the masculine vs feminine and the sociable vs non-sociable. As would be expected, the interest-in "things" groups (O, M, C, S, Cl),

with the exception of the C1 female, were more masculine and had narrow interest, while the interest-in-people (P, SS) and aesthetic groups (A, L, Mu), with the exception of the P males, were more feminine and had broader interests. The outdoor, mechanical and clerical interest groups were socially submissive, while others (S, C) were not. All of the female things (O, M, C, S, C1) groups were socially submissive. Both the male and female people (P, SS) groups were sociable. These findings seem consistent with most of the previous studies.

Although past studies have found the aesthetic interest groups (A, L, Mu) to be more maladjusted, the present findings do not suggest this. The group was found, however, to be more feminine, sociable, and non-conforming, with the exception of the male L group which was very conforming as indicated by the low Pd on the MMPI.

The analysis of variance showed that the interest variables differentiated the groups better than the personality variables. In the main, the "things" group rejected "person" and "aesthetic" interests. However, there were three exceptions: the Outdoor group had high artistic interests; the Science group had high social service interests; and the Clerical group had high persuasive interests. The same held true of the "aesthetic" and "persons" groups which rejected the scientific-mechanical activities (including clerical and outdoor interests). However, the same three exceptions existed.

#### Personality and interest characteristics of the groups

The personality and interest characteristics described below are generally in agreement with past research and vocational theorists.

Outdoor The males can be described as adventurous, somewhat withdrawn, (in previous studies the exact opposite was reported) tending to

avoid social activities, and they are conventional. They have high scientific and artistic interests, but do not like persuasive and clerical activities. The female is mature, practical, and, like the male, avoids social activities, and has similar interests to the male group. Past research found this group to reject artistic activities.

Mechanical. This group has the most masculine interests, and the males appear to be less conforming. The males have very high outdoor, computational, scientific, and clerical interests, significantly lower persuasive and literary interests. The females have very narrow interests and reject every interest except mechanical.

Computational. This group appeared to be the "best adjusted," since they scored lower than the mean on all scales of the MMPI. The males can be characterized as masculine, having narrow interest, conventional, orderly, and timid; the females as very conforming. Both enjoy mechanical, scientific, and clerical activities, but reject aesthetic and people oriented activities.

Scientific. The males seem to be more masculine, with narrow interests, and they also seem quite conventional. The females avoid social interaction, and are quite conforming. Both enjoy outdoor, mechanical, and computational activities, and like to help others. Most past studies found this group tending to avoid social interaction, but they do seem to find satisfaction in helping others. This disagrees with Crites (1963) study quoted earlier.

Persuasive. This group can be classified by adjectives such as sociable, verbal and fluent, aggressive, and outgoing. In addition, the females can be described as frank, assertive, and high strung. Both enjoy reading and writing, helping people (it is not possible to tell the

motive), and clerical activities. They do reject scientific-mechanical and artistic activities.

Artistic. This group can be described only as being sensitive and feminine. They enjoy working outdoors, using tools, and meeting with people (this disagrees with most research), and reject scientific activities.

Literary. This group tends to enjoy activities generally classified as feminine; to be sensitive and responsive. The males were also overly conforming. They enjoy verbal-persuasive activities, and rejected scientific-mechanical activities.

Musical. This group can be classified as sensitive, emotional and feminine. The males were found to be less conforming and have narrow interests. The females enjoy persuasive and aesthetic activities.

Social Service. The males seem to be overly conforming, passive, sensitive, and emotional; the females to be good tempered, modest and orderly. Although both enjoy meeting people and reject mechanical-computational activities, they disagree in that the males have aesthetic interests, while the females enjoy scientific activities.

Clerical. The males tend to be shy, conforming, non-aggressive, and avoid social interactions; the females, too, avoid social interactions and are orderly, alert, and friendly. They enjoy computational activities, and meeting people (this seems to conflict with avoidance of social interactions), and reject scientific-mechanical and artistic interests.

## CHAPTER V

## SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary

The trend toward using a battery of tests in helping students to make educational and vocational choices, plus the fact that vocational choice theories suggest an inter-relationship between vocational interest and personality characteristics have greatly complicated test interpretation. Two tests frequently used to assess the vocational interest and personality characteristics of an individual are the Kuder and MMPI.

To help counselors make better use of the Kuder and MMPI, a number of studies, some to determine the relationship of the MMPI to the Kuder, and others to determine the various personality and vocational interests of different educational majors and occupations, have been conducted. The results of these studies have tended to disagree. Because of these disagreements, it appeared necessary to learn more about the relationships between the MMPI and Kuder.

The purpose of this study was to gain more insight into four basic problems: 1. Is there a relationship between personality as measured by the MMPI and interest as measured by the Kuder? 2. If there is a relationship, what is it? 3. Is it possible to discriminate between groups that score high on the various interest scales of the Kuder by using personality traits as measured by the MMPI and interest as measured by the Kuder?

The subjects in this study were freshmen students who were admitted to Brigham Young University and Utah State University fall quarter, 1959. The sample included only those who took the MMPI and Kuder during orientation week. The Kuder and MMPI raw scores (K added to MMPI raw scores) were converted to standard scores. The separate male and female samples were then divided into ten groups according to their highest ranked interest for the statistical analysis.

The present study attempted to determine (a) the relationship between the interest and personality variables (b) significant differences between various interest groups on personality and interest variables (c) which variables best identify the ten interest groups. The following statistics were used: Analysis of Variance, and T-test.

Analysis of Variance was computed on the mean scores of the thirteen MMPI scales and ten Kuder scales for the ten interest groups, to infer relationships and determine if significant differences existed between the ten interest groups on the personality and interest variables. To determine where the significant differences were among the means of the personality and interest variables, the T-test was used to compare every group mean of a particular variable with every other group mean of the same variable. In both statistical comparisons, male and female samples were considered separately.

In agreement with the findings in the literature, the analysis of variance F-test found the ten interest groups to be significantly different on the following MMPI scales: for both groups, Mf (.01), Si (.01), Pd, Pa, Sc, (all at the .05 level); for the males, D (.01), L, F, and Pt (at the .05 level); for the females, Hy, and Ma (both at the .01 level). The ten interest groups were found to be significantly different on all of the Kuder scales at the .01 level of significance.

On the personality and interest variables, the most significant differences were found between the interest in "things" groups (O, M, C, S, Cl) and the "person" (P, SS)- "aesthetic" (A, L, Mu) groups. The "things" groups tended to score higher on the Si scale, and lower on the Mf, while the "person" and "aesthetic" groups tended to score the exact opposite. On the Kuder the "things" group scored higher on the mechanical-scientific scales (outdoor and clerical included) rejecting the other interests, while the "person" and "aesthetic" groups scored higher on the "person" and "aesthetic" scales and rejected the scientific-mechanical scales. There were exceptions to these general findings and they were noted in the preceding chapter.

The aesthetic group was not found to be maladjusted and the only sex differences were on the most masculine female group, Mechanical, and the most feminine interest group, Musical.

### Conclusions

On the basis of the results of this study, the following conclusions have been reached:

1. Inasmuch as there were significant relationships between high scoring groups on the Kuder and certain scales of the MMPI the null hypothesis that there is no relationship between the two tests must be rejected.

2. The t-test showed that the MMPI discriminated the various interest groups with the following factors: masculinity vs femininity, non-sociable vs sociable, and to a lesser extent, conformity vs non-conformity. Therefore, the null hypothesis that the MMPI would not discriminate between groups must be rejected.

3. The t-test showed that the Kuder significantly discriminated between the various interest groups; therefore, the null hypothesis that it would not discriminate between groups must be rejected also.

4. Since the F-test showed the Kuder to be significant at the .01 level on all of the scales, it must be concluded that for this population the Kuder better differentiates the various interest groups than the MMPI.

5. There is a need for additional research to determine if educational and vocational groups manifest the same MMPI and Kuder scores as was found in this study.

#### Recommendations

As a result of the information gathered and the conclusions reached, the following recommendations are made:

1. That counselors use both the MMPI and Kuder in helping students to make occupational and educational choices, since they appear to be valid tests for distinguishing personality and interest trends amongst various vocational interest groupings.

2. That counselors use the following significant findings, when using the MMPI and Kuder to help students make educational and occupational choices.

#### Summary of Significant Findings

<u>Scale</u>	<u>Male</u>			
	<u>MMPI</u>		<u>Kuder</u>	
	+	-	+	-
Outdoor	Si	Pd, Mf	M, S, A	P, Mu, Cl
Mechanical		F, Mf	O, S,C,A	P, L, Mu
Computational		F, Mf, Pt, Sc, Pa	M, S, Cl	P
Scientific		Mf, Pa	O, M, C, SS	P, Mu



Scale	<u>Male</u>			
	MMPI		Kuder	
	+	-	+	-
Persuasive	Pd	D, Pt, Si	Mu, SS, Cl	O, M, S, A
Artistic	Mf	Pd	O, M, P	C, S, Cl
Literary	Mf, Pa	Pd	P, Mu, Cl	M
Musical	Pa, Pd, Mf			D, M, C, S, P, SS, Cl
Social Service	L, Pa, Mf		L, Mu	O, M, C, P, A, Cl
Clerical	Pt, Si	D	C, P, L	O, M

+ significantly above mean

- significantly below mean

Scale	<u>Female</u>			
	MMPI		Kuder	
	+	-	+	-
Outdoor	Si	Ma	M, S, A	C, P, Cl
Mechanical	Mf			C, P, L, Mu, SS, Cl
Computational	Mf	Pd, Sc	M, S, Cl	P
Scientific			O, M, C, SS	P, Mu, Cl
Persuasive	Pd, Ma	Si	L, SS, Cl	O, M
Artistic			O, M, P	
Literary	Pa	Mf	P	O, M
Musical		Mf, Si	P, A, L	O, M
Social Service	Hy		O, P	M
Clerical	Si	Hy, SC	C, P	O, M, S, A

+ significantly above mean

- significantly below mean

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APPENDIX

Mean MMPI T-Scores for the 10 Interest Groups

MMPI

MALE

Group	L	F	K	Hy	D	Hs	Pd	Mf	Pa	Pt	Sc	Ma	Si
Outdoor	48.8	53.5	54.0	52.0	51.6	55.6	56.4	55.4	56.4	59.8	56.6	55.8	52.4
Mech.	48.4	52.5	55.2	53.9	50.9	56.6	59.7	54.8	55.4	59.9	58.7	56.3	50.6
Comp.	49.0	52.5	54.9	53.5	50.3	55.9	57.4	56.2	55.0	56.3	54.5	55.3	49.4
Scientific	48.8	53.5	54.9	52.5	49.6	55.4	59.1	55.4	54.7	57.9	59.2	56.8	49.2
Persuasive	48.1	54.2	55.1	53.1	48.3	55.8	60.0	57.8	55.7	56.4	57.7	58.1	46.3
Artistic	49.7	55.4	54.9	54.1	52.3	55.7	59.8	60.1	55.8	58.3	57.8	56.9	49.5
Literary	47.8	54.9	54.2	52.8	52.2	55.0	56.6	61.5	57.8	58.8	58.7	56.4	48.9
Music	48.1	53.5	54.1	53.8	51.5	57.0	60.0	61.5	57.4	60.1	59.8	56.2	49.6
Soc. Serv.	51.9	54.8	54.6	53.1	52.5	56.3	58.7	60.2	58.5	60.1	58.3	55.2	49.8
Clerical	50.4	55.3	53.3	52.3	55.6	55.4	58.4	56.8	55.0	61.8	60.1	53.7	53.0
Total mean	49.1	53.96	54.3	53.1	51.4	55.9	58.6	57.9	56.4	58.9	58.0	56.1	50.0

FEMALE

Group	L	F	K	Hy	D	Hs	Pd	Mf	Pa	Pt	Sc	Ma	Si
Outdoor	51.8	54.2	55.4	51.3	49.9	55.1	56.2	48.7	57.8	57.7	57.5	52.7	53.5
Mech.	50.6	52.7	55.2	51.6	49.6	56.4	57.2	49.5	56.8	57.1	56.1	55.8	50.6
Comp.	51.2	53.5	55.6	51.6	49.1	55.1	55.6	49.5	56.0	55.4	55.0	53.2	52.6
Scientific	51.0	51.6	55.8	50.4	49.4	55.1	57.7	48.8	57.3	58.2	56.6	55.1	52.7
Persuasive	50.1	53.0	56.6	51.8	49.3	56.8	59.9	47.3	57.7	56.3	56.7	59.3	48.1
Artistic	50.1	53.3	55.5	51.6	51.8	56.6	58.4	47.4	58.3	58.1	56.4	54.2	52.1
Literary	50.2	52.1	56.6	51.9	50.0	56.3	59.4	43.6	59.5	58.0	58.4	55.6	50.5
Music	51.0	52.7	57.0	52.4	49.2	57.1	57.6	45.2	58.9	57.3	56.8	55.2	48.7
Soc. Serv.	50.8	51.7	57.6	54.6	51.1	56.4	57.3	47.0	56.8	58.2	58.3	55.6	50.9
Clerical	51.2	52.7	55.0	50.0	51.0	54.4	57.3	46.5	56.4	56.8	55.0	54.0	53.1
Total Mean	50.8	52.7	55.9	51.6	50.1	55.9	57.8	47.2	57.6	57.3	56.7	55.1	51.3



Mean T Scores for Kuder Scales

MALE

<u>Group</u>	<u>N</u>	<u>O</u>	<u>M</u>	<u>C</u>	<u>S</u>	<u>P</u>	<u>A</u>	<u>L</u>	<u>Mu</u>	<u>SS</u>	<u>C1</u>
Outdoor	138	66.1	54.9	47.1	53.0	45.2	50.0	47.3	45.3	48.7	46.2
Mech.	99	53.0	63.4	49.7	52.5	46.6	50.0	42.4	46.2	48.1	49.3
Comp.	88	48.6	51.3	65.6	55.5	47.3	46.3	47.7	47.3	46.9	53.9
Scientific	85	52.6	53.0	52.0	62.9	46.2	46.2	48.1	43.3	49.7	48.9
Persuasive	88	43.8	44.0	46.8	45.6	67.0	45.7	50.1	51.2	51.6	52.6
Artistic	112	50.8	50.4	45.6	45.2	49.6	62.1	49.0	48.9	47.4	47.0
Literary	72	47.4	45.7	49.1	47.7	50.7	49.6	66.2	51.6	48.8	50.2
Music	104	44.3	43.0	43.8	42.6	46.9	46.9	48.2	61.2	43.4	44.7
Soc.	89	50.0	45.3	45.9	48.7	49.6	45.8	51.1	50.4	66.1	45.2
Clerical	71	44.7	47.6	56.3	46.2	52.2	48.0	51.4	48.1	46.5	68.0
Total	946	50.9	50.3	49.6	50.0	49.7	50.0	49.6	49.3	49.6	49.9

FEMALE

<u>Group</u>	<u>N</u>	<u>O</u>	<u>M</u>	<u>C</u>	<u>S</u>	<u>P</u>	<u>A</u>	<u>L</u>	<u>Mu</u>	<u>SS</u>	<u>C1</u>
Outdoor	95	67.5	52.0	45.6	54.2	43.9	53.2	48.7	49.1	50.5	43.9
Mech.	113	48.5	60.6	44.5	47.9	41.7	46.1	41.5	43.1	41.8	42.9
Comp.	85	48.0	50.1	69.0	53.0	47.5	47.3	48.5	49.3	46.8	55.9
Scientific	91	53.8	53.8	52.5	66.5	45.1	47.8	47.3	46.3	52.4	46.2
Persuasive	109	43.0	46.8	46.9	45.6	65.7	46.4	50.6	48.4	51.3	52.0
Artistic	115	50.1	50.8	47.0	47.2	50.3	64.3	48.5	48.4	48.8	47.2
Literary	125	46.8	45.0	48.6	47.4	52.0	48.4	70.0	49.9	48.9	48.9
Music	96	47.4	46.7	48.0	45.6	50.7	50.2	50.6	63.4	49.0	49.9
Soc.	101	49.6	47.5	47.3	50.1	50.6	47.2	47.7	48.5	62.9	47.6
Clerical	127	44.7	47.7	54.4	45.4	51.7	45.5	48.2	48.9	47.9	65.0
Total	1057	49.5	50.0	50.1	49.8	50.1	49.8	50.0	49.4	49.9	50.2

## Significant T-test MMPI Scales

L ScaleMaleRnk Means

SS  
 Cl  
 A  
 Mn  
 C  
 O  
 S  
 M  
 Mu  
 P  
 L

higher than

A' C' O'' S'' M'' Mu'' P'' L''  
 L'

FemaleRnk Meanshigher than

None Significant

F ScaleMaleRnk Means

A  
 Cl  
 L  
 SS  
 P  
 Mn  
 O  
 S  
 Mu  
 M  
 C

higher than

M'' C''  
 M'' C''  
 M'' C''

FemaleRnk Meanshigher than

None Significant

!.05 level of significance

".01 level of significance

## Significant T-test MMPI Scales

D-Scale

<u>Male</u>		<u>Female</u>	
<u>Rnk Means</u>	<u>higher than</u>	<u>Rnk Means</u>	<u>higher than</u>
Cl	A' SS' L' Mu' O'' M'' C'' S'' P''	None	Significant
A		S'	P''
SS		P''	
L		P'	
O		P'	
Mu		P'	
Mn			
M			
C			
S			
P			

Pd Scale

<u>Male</u>		<u>Female</u>	
<u>Rnk Means</u>	<u>higher than</u>	<u>Rnk Means</u>	<u>higher than</u>
Mu	C' L' O''	P	SS' Cl' O'' C''
P	C' L' O''	L	O' C''
A	L' O''	A	C'
M	L' O'	Mn	
S	O'	S	
SS		Mu	
Mn		M	
Cl		SS	
C		Cl	
L		O	
O		C	

' .05 level of significance

" .01 level of significance

## Significant T-tests MMPI Scales

Mf Scale

<u>Male</u>		<u>Female</u>	
<u>Rnk Means</u>	<u>higher than</u>	<u>Rnk Means</u>	<u>higher than</u>
L	P'' C1'' C'' O'' S'' M''	M	SS' C1' Mu'' L''
Mu	P'' C1'' C'' O'' S'' M''	C	SS' C1' Mu'' L''
A	C1' C' O'' S'' M''	S	Mu' L''
SS	C' O'' S'' M''	O	Mu' L''
Mn		A	L''
P	M''	P	L''
C1		Mn	
C		SS	L''
O		C1	L'
S		Mu	
M		L	

Pa Scale

<u>Male</u>		<u>Female</u>	
<u>Rnk Means</u>	<u>higher than</u>	<u>Rnk Means</u>	<u>higher than</u>
SS	P' M' C1' C'' S''	L	S' M' SS' C1'' C''
L	C1' C' S'	Mu	C1'' C''
Mu	C1' C' S'	A	
A	C1' C' S'	O	
O		P	
Mn		Mn	
P		S	
M		M	
C1		SS	
C		C1	
S		C	

' .05 level of significance

" .01 level of significance

## Significant T-tests MMPI Scales

Pt ScaleMaleRnk Meanshigher than

C1	A' S' P'' C''
O	P' C''
Mu	P' C'
SS	P' C'
M	P' C'
Mn	
L	
A	
S	
P	
C	

FemaleRnk Meanshigher than

None Significant

Sc ScaleMaleRnk Meanshigher than

C1	O'' C''
Mu	O' C''
S	C''
M	C''
SS	C'
L	C'
Mn	
A	C'
P	C'
O	
C	

FemaleRnk Meanshigher than

L	C1''
SS	C1''
O	C1''
Mu	
P	
Mn	
S	
A	
M	
C	
C1	

' .05 level of significance

'' .01 level of significance

## Significant T-tests MMPI Scales

Si Scale

<u>Male</u>		<u>Female</u>	
<u>Rnk Means</u>	<u>higher than</u>	<u>Rnk Means</u>	<u>higher than</u>
C1	SS' Mu' A' C' S' L' P''	O	M' L' Mu'' P''
O	Mu' A' C' S' L' P''	C1	M' L' Mu'' P''
M	P''	C	Mu'' P''
Mn		S	Mu'' P''
SS	P'	A	Mu'' P''
Mu	P'	Mn	
A	P'	SS	P'
C	P'	M	P'
S	P'	L	P'
L		Mu	
P		P	

' .05 level of significance

" .01 level of significance

## Significant T-tests MMPI Scales

Hy ScaleFemaleRnk Meanshigher than

SS	Mu' P' A" M" C" L" O" S" C1"
Mu	C1'
L	C1'
P	
M	
C	
Mn	
A	
O	
S	
C1	

Ma ScaleFemaleRnk Meanshigher than

P	M' L' SS' M' S" A" C1" C" O"
M	O'
L	O'
SS	
Mu	
Mn	
S	
A	
C1	
C	
O	

' .05 level of significance

" .01 level of significance

Significant T-test Kuder Scales

Outdoor Scale

Male

Rank Order

M	higher than	SS", C", L" C1", Mu" P"
S		SS', C", L" C1", Mu" P"
Mn		
A		C', L" C1", Mu" P"
SS		L' C1", Mu" P"
C		C1", Mu" P"
L		P"
C1		
Mu		
P		

Female

Mn Rank

S	higher than	A" SS" M" C" Mu" L" C1" P"
A		M" C" Mu" L" C1" P"
Mn		
SS		Mu" L" C1" P"
M		Mu" L" C1" P"
C		Mu" L" C1" P"
Mu		C1" P"
L		P"
C1		P"
P		

Mechanical Scale

Male

Mean Rank

O	higher than	S', C", A", C1" L", SS" Mu" P"
S		A', C1" L", SS" Mu" P"
C		C1" L", SS" Mu" P"
A		C1' L", SS" Mu" P"
Mn		
C1		Mu" P"
L		
SS		
P		
Mu		

Female

Mean Rank

S	higher than	A" C" C1" SS" Mu" P" L"
O		C1" SS" Mu" P" L"
A		C1" SS" Mu" P" L"
C		C1" SS' Mu" P" L"
Mn		
C1		L"
SS		L"
P		L"
Mu		L"
L		

' .05 level of significance

" .01 level of significance



Significant T-test Kuder Scales

Computational Scale

Male

Female

Rn Mn  
 Cl  
 S  
 M  
 Mn  
 L  
 O  
 P  
 SS  
 Mu

higher than  
 S'' M'' L'' O'' P'' SS'' A'' Mu''  
 M' L' O' P' SS'' A'' Mu''  
 L' O' P' SS'' A'' Mu'  
 SS' A' Mu'  
 Mu'  
 Mu'

Rnk Mn  
 Cl  
 S  
 Mn  
 L  
 Mu  
 SS  
 A  
 P  
 O  
 M

higher than  
 L'' Mu' SS'' A'' P'' O'' M''  
 L'' Mu'' SS'' A'' P'' O'' M''  
 O'' M''  
 O' M'

Scientific Scale

Male

Female

Rn Mns  
 C  
 O  
 M  
 Mn  
 SS  
 L  
 Cl  
 P  
 A  
 Mu

higher than  
 O' M'' SS'' L'' C1'' P'' A'' Mu''  
 SS'' L'' C1'' P'' A'' Mu''  
 SS'' L'' C1'' P'' A'' Mu''  
 P' A'' Mu''  
 A' Mu''  
 Mu''

Rnk Mns  
 O  
 C  
 Mn  
 SS  
 M  
 L  
 A  
 P  
 Mu  
 Cl

higher than  
 C'' SS' M'' L'' A'' P'' Mu'' C1''  
 SS'' M'' L'' A'' P'' Mu'' C1''  
 P'' Mu'' C1''  
 C1''  
 C1''  
 C1''  
 C1''

' .05 level of significance

" .01 level of significance

Significant T-test Kuder Scales

Persuasive Scale

Male

Rnk Means

Cl  
L  
Mn  
SS  
A  
C  
Mu  
M  
S  
O

higher than

A' SS' C'' Mu'' M'' S'' O''  
C'' Mu' M'' S'' O''  
C' Mu' M'' S'' O''  
C' Mu' M'' S'' O''  
O''

Female

Rnk Mns

L  
Cl  
Mu  
SS  
A  
Mn  
C  
S  
O  
M

higher than

A'' C'' S'' O'' M''  
C'' S'' O'' M''  
C'' S'' O'' M''  
C'' S'' O'' M''  
C' S'' O'' M''  
S'' O'' M''

Artistic Scale

Male

Rnk Means

M  
O  
Mn  
L  
Cl  
Mu  
C  
S  
SS  
P

higher than

Mu'' C'' S'' SS'' P''  
Mu'' C'' S'' SS'' P''  
C'' S'' SS'' P''

Female

Rnk Means

O  
Mu  
MN  
L  
S  
C  
SS  
P  
M  
Cl

higher than

Mu'' L'' S'' C'' SS'' P'' M'' Cl''  
L' S' C' SS'' P'' M'' Cl''  
P' M'' Cl''  
Cl''

' .05 level of significance

'' .01 level of significance

Significant T-test Kuder Scales

Literary Scale

Male

Rnk Means

Cl  
SS  
P  
Mn  
A  
Mu  
S  
C  
O  
M

higher than

Mu' S'' C'' O'' M''  
Mu' S'' C'' O'' M''  
C' O'' M''  
M''  
M''  
M''  
M''  
M''

Female

Rnk Means

Mu  
P  
Mn  
O  
A  
C  
Cl  
SS  
S  
M

higher than

A' Cl'' SS' S'' M''  
A' Cl' SS'' S'' M''  
M''  
M''  
M''  
M''  
M''  
M''

Musical Scale

Male

Rnk Means

L  
P  
SS  
Mn  
A  
Cl  
C  
M  
O  
S

higher than

A' Cl' C'' M'' O'' S''  
A' Cl' C'' M'' O'' S''  
C' M'' O'' S''  
M' O'' S''  
O' S''  
O' S''  
S''  
S''

Female

Rnk Means

L  
Mn  
C  
O  
Cl  
SS  
P  
A  
S  
M

higher than

S'' M''  
S'' M''  
S' M''  
S' M''  
S' M''  
S' M''  
S' M''  
M'

' .05 level of significance  
" .01 level of significance

Significant T-test Kuder Scales

Social Service Scale

Male

Female

Rnk Means

higher than

Rnk Means

higher than

P	L' O' Mu'' A'' C'' C1'' M''
S	A'' C'' C1' M'
Mn	
L	M''
O	M''
M	M''
A	M''
C	M''
C1	M''
Mu	

S	Mu'' L'' A'' C1'' C'' M''
P	Mu'' L' A' C1' C' M'
O	
Mn	
Mu	M''
L	M''
A	M''
C1	M''
C	M''
M	

Clerical Scale

Male

Female

Rnk Means

higher than

Rnk Means

higher than

C	L'' M'' S'' A'' O'' SS'' Mu''
P	L' M'' S'' A'' O'' SS'' Mu''
L	A'' O'' SS'' Mu'
Mn	
M	A'' O'' SS'' Mu''
S	
A	O'' SS'' Mu'
O	
SS	
Mu	

C	P'' Mu'' L'' SS'' A'' S'' O'' M''
P	Mu' L'' SS'' A'' S'' O'' M''
Mn	
Mu	SS' A'' S'' O'' M''
L	S'' O'' M''
SS	O'' M''
A	O'' M''
S	O'' M''
O	
M	

' .05 level of significance

'' .01 level of significance