INFORMATION TO USERS

This material was produced from a microfilm copy of the original document. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the original submitted.

The following explanation of techniques is provided to help you understand markings or patterns which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting thru an image and duplicating adjacent pages to insure you complete continuity.

2. When an image on the film is obliterated with a large round black mark, it is an indication that the photographer suspected that the copy may have moved during exposure and thus cause a blurred image. You will find a good image of the page in the adjacent frame.

3. When a map, drawing or chart, etc., was part of the material being photographed the photographer followed a definite method in "sectioning" the material. It is customary to begin photoing at the upper left hand corner of a large sheet and to continue photoing from left to right in equal sections with a small overlap. If necessary, sectioning is continued again — beginning below the first row and continuing on until complete.

4. The majority of users indicate that the textual content is of greatest value, however, a somewhat higher quality reproduction could be made from "photographs" if essential to the understanding of the dissertation. Silver prints of "photographs" may be ordered at additional charge by writing the Order Department, giving the catalog number, title, author and specific pages you wish reproduced.

5. PLEASE NOTE: Some pages may have indistinct print. Filmed as received.

Xerox University Microfilms
300 North Zeib Road
Ann Arbor, Michigan 48106
FISHBURNE, Jr., Francis Joseph, 1938-
The Concurrent Validity of Two Measures Operationalizing Holland's Theory Using a Sample of Non-Professional Workers.
The Ohio State University, Ph.D., 1973
Psychology, general
THE CONCURRENT VALIDITY OF TWO MEASURES OPERATIONALIZING HOLLAND'S
THEORY USING A SAMPLE OF NON-PROFESSIONAL WORKERS

DISSERTATION

Presented in Partial Fulfillment of the Requirements for
the Degree Doctor of Philosophy in the Graduate
School of The Ohio State University

by

Francis Joseph Fishburne, Jr., B.S., M.A.

The Ohio State University
1973

Reading Committee:
Dr. Frank M. Fletcher
Dr. Maude A. Stewart
Dr. W. Bruce Walsh

Approved by

W. Bruce Walsh
Adviser
Department of Psychology
ACKNOWLEDGEMENTS

The author wishes to express his sincere gratitude to Dr. W. Bruce Walsh for his thoughtful advice, cooperation, and encouragement throughout the course of this study. Ms. Judie Bitzel, who typed the manuscript, was indispensable. Special recognition is due my wife, Ginna, who saw to it that I had quiet in a house with four children, and who took time from her studies to carefully edit the manuscript.
VITA

December 11, 1938  Born - Charleston, South Carolina

1961  B.S., United States Military Academy, West Point, New York

1961-1962  Student, United States Army Field Artillery Basic Officer Course, Fort Sill, Oklahoma

1962-1965  United States Army Officer, Bamberg, Germany

1965-1966  Student, United States Army Field Artillery Advanced Officer Course, Fort Sill, Oklahoma

1966-1967  Graduate Study, The Ohio State University, Columbus, Ohio

1967  M.A., The Ohio State University, Columbus, Ohio

1967-1970  Admissions Officer, United States Military Academy, West Point, New York

1970-1971  Staff Officer, United States Army Vietnam, Long Binh, Vietnam

1971-1972  Graduate Study, The Ohio State University, Columbus, Ohio

1972-1973  Psychology Intern, Capital University Counseling Center, Columbus, Ohio
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>ACKNOWLEDGEMENTS</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>VITA</td>
<td>iii</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>viii</td>
</tr>
</tbody>
</table>

## CHAPTER

### I. INTRODUCTION

- Overview of Holland's Theory

### II. REVIEW OF THE LITERATURE

- Introduction
- Investigations of the Personal Orientations and Their Influence
- Investigations of the Environmental Orientations and Their Influence
- Investigations of the Person and Environment Interaction
- Investigations of Vocational Stereotypes as Related to Holland's Theory
- Investigations of the Level Hierarchy
- Classification Schemes for Vocations and Major Fields
- New Instruments
- Summary

### III. METHODOLOGY

- Sample
- Instruments
- Procedure
- Hypotheses

### IV. RESULTS

- Individual Scale Discrimination of Occupational Groups
- Relationship of Same Named Scales
- Summary
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>V. DISCUSSION</td>
<td>84</td>
</tr>
<tr>
<td>VI. SUMMARY, CONCLUSIONS AND IMPLICATIONS</td>
<td>92</td>
</tr>
<tr>
<td>Summary</td>
<td>92</td>
</tr>
<tr>
<td>Major Findings and Conclusions</td>
<td>93</td>
</tr>
<tr>
<td>Limitations</td>
<td>95</td>
</tr>
<tr>
<td>Implications</td>
<td>96</td>
</tr>
<tr>
<td>APPENDIX</td>
<td>98</td>
</tr>
<tr>
<td>A.</td>
<td>99</td>
</tr>
<tr>
<td>BIBLIOGRAPHY</td>
<td>102</td>
</tr>
</tbody>
</table>
### LIST OF TABLES

<table>
<thead>
<tr>
<th>Table</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Summary of the Demographic Characteristics of the Occupational Groups</td>
</tr>
<tr>
<td>2</td>
<td>Summary of the Analysis of Variance of the Scores on the Eleven Scales of the Vocational Preference Inventory for the Six Occupational Groups</td>
</tr>
<tr>
<td>3</td>
<td>Summary of the Analysis of Variance of the Scores on the Six Scales of the Self-Directed Search for the Six Occupational Groups</td>
</tr>
<tr>
<td>4</td>
<td>Summary of the Tukey (b) Analysis of All Possible Combinations of Occupational Groups on the Scales of the Vocational Preference Inventory Which Had Significant F Tests</td>
</tr>
<tr>
<td>5</td>
<td>Means and Standard Deviations for the Six Occupational Groups on the Eleven Scales of the Vocational Preference Inventory</td>
</tr>
<tr>
<td>6</td>
<td>Summary of the Tukey (b) Analysis of All Possible Combinations of Occupational Groups on the Scales of the Self-Directed Search Which Had Significant F Tests</td>
</tr>
<tr>
<td>7</td>
<td>Means and Standard Deviations for the Six Occupational Groups on the Six Scales of the Self-Directed Search</td>
</tr>
<tr>
<td>8</td>
<td>Rank Order of the Mean Scores for the Realistic Scale Across the Two Instruments</td>
</tr>
<tr>
<td>9</td>
<td>Rank Order of the Mean Scores for the Investigative Scale Across the Two Instruments</td>
</tr>
<tr>
<td>10</td>
<td>Rank Order of the Mean Scores for the Artistic Scale Across the Two Instruments</td>
</tr>
<tr>
<td>11</td>
<td>Rank Order of the Mean Scores for the Social Scale Across the Two Instruments</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
<tr>
<td>12</td>
<td>Rank Order of the Mean Scores for the Enterprising Scale Across the Two Instruments</td>
</tr>
<tr>
<td>13</td>
<td>Rank Order of the Mean Scores for the Conventional Scale Across the Two Instruments</td>
</tr>
<tr>
<td>14</td>
<td>Summary of the Highest Mean Score for Each Occupational Group Across the Two Instruments</td>
</tr>
<tr>
<td>15</td>
<td>Correlations of Same Named Scales of the Vocational Preference Inventory Vocational Scales and the Occupation Scales of the Self-Directed Search</td>
</tr>
<tr>
<td>16</td>
<td>Correlations of Same Named Scales of the Vocational Preference Inventory Vocational Scales and the Self-Directed Search Summary Scales</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>A hexagonal model for interpreting inter- and intra-class relationships</td>
</tr>
</tbody>
</table>
CHAPTER I

INTRODUCTION

Vocational theory in its broadest sense attempts to explain the behavior of the individual as he relates to the world of work. The development of theory is a never ending quest to find general explanations of natural events. Theory, then attempts to gain an understanding of phenomena by bringing the greatest number of facts and observations under the fewest possible assumptions, concepts, and principles (Carkhuff, Alexik and Anderson, 1967). It is at the level of raw data that theory is supported or not supported, and it is to or from this level that theory is constructed depending on whether it is inductively or deductively derived. Raw data is particularly important as it determines the scope of the generalizations which may be legitimately made. Taking observations from a limited segment of a population, e.g., observations of professional workers from a population which consists of professional and non-professional workers, limits the generalizations which can be made from this data to generalizations about professional workers. To expand such generalizations to non-professional workers, observations must be taken on a representative sample which includes both professional and non-professional workers. Where generalizations are made which go beyond the scope of the raw data, it becomes necessary to verify such generalizations by testing them on broader or more inclusive samples of the population to which
the generalization has been made. Unverified generalizations have heuristic value in pointing directions for research or in leading the skeptical scholar to devise alternate hypothetical interpretations. When, however, these statements are accepted either as a priori knowledge or as confirmed generalizations, the cause of a science of vocational psychology is poorly served.

As theory expands in generality and grows in specificity it becomes increasingly useful to the applied psychologist. Thus, as theory is developed and generalized it should be tested to insure the validity of such generalizations. Where, then, does vocational theory stand in this regard?

After surveying vocational theory extant, Osipow (1968) concluded: "The theories appear to be much too broad in scope and generally too skimpy in detail" (p. 247). He lists several shortcomings among which is the heavy reliance on observations of convenient samples to describe career behavior. Specifically, he states: "The overemphasis of student based career development research clearly places limitations on the generalizations that may be drawn from much of the data" (1968, p. 242).

In the reviews of Osipow (1968) and Crites (1969), the following vocational theories stand out as the most well established and best researched: (1) developmental (Ginzberg, Ginsburg, Axelrad and Herma, 1951; Super and Bachrach, 1957; Super, 1969); (2) typological (Holland, 1959, 1966a); (3) need (Roe, 1956, 1957); (4) psychoanalytic (Bordin, Nachmann and Segal, 1963). The formulations of the theory developed by Ginzberg, and his associates were derived from interviews with
talented adolescent boys and girls. The theory of vocational choice proposed by Roe (1956, 1957) stems from her research on eminent scientists. The psychoanalytic theory of Bordin, Nachmann and Segal (1963) has its basis in three studies dealing with seven professional occupations, Segal's (1961) research with college students of creative writing and accounting; and Nachmann's (1960) and Galinsky's (1962) research with graduate students in the fields of law, dentistry, social work, physics and clinical psychology. Finally, Holland (1959, 1966a) has substantiated his theory with research on large groups of students participating in the National Merit Scholarship Program, generally college bound students. With the exception of Super and Bachrach (1957), whose research has generally been conducted on a college/non-college bound sample of high school students, the foregoing theories have resulted from observations of a very talented\(^1\) segment of the work force or potential work force.

In his discussion of vocational theories, Osipow (1968) reviewed research stimulated by or relevant to the theories. This writer classified the research reviewed, according to the subjects utilized, into the following groups: (1) adolescent, (2) college students, (3) college graduates in the world of work, (4) non-college graduates in the world of work, and (5) unspecified. Osipow cited sixty-two pieces of research relating to the theories listed above. Of these sixty-two pieces of research, twenty-two were conducted

---

\(^1\)The term "talented" is used in the literature to describe college or college bound subjects, and is used in this paper interchangeably with academically capable.
using college students; twelve were conducted using college graduates in the world of work; two were conducted using a combination of college students and college graduates in the world of work; one was conducted using non-college graduates in the world of work; and five were conducted for which the subject groups were unspecified. Six of the works of research reviewed which fell in the adolescent subject category were accomplished by Holland and his associates using National Merit Finalists, an elite college bound group. From the reviews of the remaining research using adolescent groups, it was not possible to determine the career plans of the samples' subjects. It is striking to note, however, that 60 per cent of the research for whom subjects could be identified was conducted using a college student or college graduate in the world of work sample. At most 29 per cent, seventeen pieces of research, could tentatively be identified as working with samples which contained some non-college bound students or non-college attending workers. Thus, one might conclude that a possible shortcoming of these theories of vocational behavior is that their validity for the non-college bound worker may be questionable. Specifically, Holland's theory, for which only one research endeavor utilizing a potential non-college student sample was reviewed by Osipow, suffers from this shortcoming. Holland (1963a, 1966a) has taken pains to point out that the samples with which he has worked are narrow and prevent ready generalization. Although Holland cautions the reader, he adopts a somewhat different philosophy, "I admit that I have gone well beyond the data; however, I feel that there is as much risk in creeping empiricism as in idle speculation" (Holland, 1966a, p. viii).
Pursuing his philosophy, Holland (1971) has extended his instrumentation to the Self-Directed Search (SDS) which he represents as a low cost vocational guidance system. Included in the SDS is a booklet containing a list of occupations for which, depending upon the outcome of the search portion, an individual might be suited. A large number of the listed occupations require semi-skilled or unskilled laborers, i.e., non-college degreed persons for whom the validity of Holland's theory of vocational behavior has not been tested. Thus, the present study investigated the applicability of Holland's theory of vocational behavior to a broad segment of non-college degreed persons who were established in a working environment.

Overview of Holland's Theory

Much of the work of Holland (1966a) has its roots in the trait-factor approach to vocational choice. Holland has attempted to delineate a theory of vocational choice comprehensive enough to integrate existing knowledge and, at the same time, sufficiently close to observables to stimulate further research. In so doing Holland has generalized beyond the trait-factor approach and evident in his theory, are the general influences of need theory, role theory, self theory, social learning theory, psychoanalytic theory and sociology (Carkhuff, Alexik and Anderson, 1967).

Although not specifically cited, Holland's theoretical formulations appear to stem from Lewin's (1935) postulation that behavior is a function of the interaction of person and environment, \( B = f(P,E) \). Essentially, Holland postulates that the individual at any given point in time represents the product of the interaction of his particular
heredity with a variety of cultural, social, economic, and personal forces, and the physical environment which results in a hierarchy of preferred methods for dealing with environmental tasks. Thus, Holland puts forth the following as the basic assumptions of his theory:

1. In our culture, most persons can be categorized as one of six types: Realistic, Investigative, Social, Conventional, Enterprising, and Artistic.

2. There are six kinds of environments which can be classified as: Realistic, Investigative, Social, Conventional, Enterprising, and Artistic.

3. People search out an agreeable environment in which they can deal most effectively with their interpersonal problems and develop their skills and abilities.

4. A person's behavior must be viewed in an interactional focus to include both his predominate personality type as well as the environment in which he acts (Holland, 1966a).

Holland conceptualizes personality and environment as being divided into six basic types. Within either the domain of the environment or personality for a particular type, Holland depicts the characteristics of each in similar psychological terms. The Realistic individual would have the following characteristics:

This type is masculine, physically strong, unsociable, aggressive; has good motor coordination and skills; lacks verbal and interpersonal skills; prefers concrete to abstract problems; sees himself as aggressive and masculine with conventional political and economic goals; rarely performs creatively in the arts or sciences. Such men prefer occupations such as mechanic, electrician, fish and wildlife specialist, crane operator and tool designer (Campbell and Holland, 1972).

The Realistic environment would have corresponding characteristics:

The Realistic environment is characterized by the explicit, physical, concrete tasks with which it confronts its inhabitants. Effective solutions often require mechanical

---

2The term Investigative has been recently adopted by Holland (1972) in lieu of the term Intellectual.
ingenuity and skill, persistence, and physical movement from place to place, often outdoors. The Realistic environment demands only minimal interpersonal skills, because most of the tasks it sets can be accomplished by superficial and casual relationships that frequently require only stereo-typed conversations. Tasks frequently call for simple sets of action. The explicit quality of the environmental demands make "success" and "failure" almost immediately obvious (Holland, 1966a).

The remaining personality types are:

**Investigative:** This category includes those who are task-oriented, introspective and asocial; prefer to think through rather than act out problems; have greater curiosity about the need to understand physical world; enjoy ambiguous work tasks; prefer to work independently; have unconventional values and attitudes. These men tend to choose occupations such as astronomer, biologist, chemist, writer of technical articles, and zoologist.

**Social:** This type is sociable, responsible, feminine, humanistic, religious, needs attention; has verbal and interpersonal skills, avoids intellectual problem solving, physical exertion, and highly ordered activities; prefers to solve problems through feelings and interpersonal manipulations of others. Vocational preferences include clinical psychologist, missionary, high school teacher, marriage counselor and speech therapist.

**Conventional:** Conventional men prefer structured verbal and numerical activities; are conforming and prefer subordinate roles; are effective at well-structured tasks, but avoid ambiguous situations and problems involving interpersonal relationships and physical skills; identify with power; value material possessions and status. Vocational preferences include bank examiner, bookkeeper, financial analyst, quality control expert, statistician, and traffic manager.

**Enterprising:** This type has verbal skills for selling, dominating, leading; sees himself as strong, masculine leader, avoids well-defined language or work situations requiring long periods of intellectual effort; differs from Conventional type in that he prefers ambiguous social tasks and has an even greater concern for power, status, and leadership; is orally aggressive. Chooses occupations such as: business executive, political campaign manager, real estate salesman, stock and bond salesman, and television producer.

**Artistic:** The artistic model is asocial; avoids problems that are highly structured or require gross physical skills; resembles Investigative type in being intraceptive and asocial but differs in having a greater need for individual expression, less ego strength; is more feminine and suffers more frequently
from emotional disturbances; prefers dealing with problems through self-expression in artistic media. Vocational preferences include artist, author, composer, writer, musician, dramatic coach, and symphony conductor (Campbell and Holland, 1972).

Generally, neither personality orientation nor environmental models exist in pure form. Holland (1959) indicates they may be ranked, according to their relative strengths, in a quasi-serial order or hierarchy. Thus, any person or environment can be represented by a six point code. In his early formulations Holland identified an individual's personality orientation according to his one highest of the six orientations and accordingly he was identified as Realistic, Investigative, etc., which ever dominated, e.g., a mechanical engineer would be Realistic. However, more recently Holland (1971) has suggested that the three highest codes convey more information and, thus, the mechanical engineer is characterized as Realistic, Investigative, Enterprising. Since the individual represents a mixture of personality types with a dominant orientation, Holland suggests that individuals tend to reach out to the environments which correspond most closely with that particular mix. Holland further posits that a man who is not clearly characterized by a personality type or who is employed in an environment different from the one which matches his personality type will vacillate and exhibit vocational indecision. According to the theory, one who is blocked from pursuing an occupation consistent with his model personality style because of training or ability deficits will either pursue a career related to his next strongest style or enter an occupation at a lower occupational level in the environment related to his major style (Osipow, 1970).
The theory incorporates the concept that within each model orientation exists a hierarchy of levels. The level hierarchy is defined in terms of the individual's intelligence and self-evaluation. Each model type is composed of a variety of jobs, thus, it is possible to have highly educated and noneducated, wealthy and poor, professional and non-professional personnel all in the same classification although some differences in high and low characteristics do exist between personality types.

The combination of model orientation and level hierarchy works in such a way that an individual gradually selects a model personality type which leads him, at the appropriate time, to make educational decisions which have implications for a specific occupational environment. As a person takes steps to implement his decisions, the level hierarchy that he has developed over the years leads him to gravitate toward a career within the appropriate occupational environment (Osipow, 1968).

In refining the elements of his theory in order to more adequately explain vocational selection and adjustment, Holland (1959, 1966a) introduces the concepts of congruence/incongruence, consistency/inconsistency, and homogeneity/heterogeneity. Persons or environments may be consistent/inconsistent and/or homogeneous/heterogeneous. Congruence/incongruence, however, are terms used to define the interaction between person and environment.

Consistency or inconsistency is determined by the two high point codes exhibited by a person or an environment. A consistent person or environment represents a combination of two types which are
compatible, e.g., Investigative - Realistic is a consistent code because the two types possess some common traits -- unsociability, an orientation toward things rather than people, self-depreciation, and masculinity. An inconsistent pair would be represented by a Realistic - Social code.

Homogeneity is a measure of the dominance of one or two types in a personality orientation or environmental model. Homogeneity is determined by assessing the difference between the highest and lowest types in the profile. The greater the difference the more homogeneous the profile.

Interaction between person and environment is termed congruent by Holland if the person and environment exhibit the same type or model. A person who is working in an occupation which corresponds to his personal orientation would be considered congruent. For example, if a person with an Artistic personality orientation was working in an Artistic occupation, his interaction with his environment would be congruent, whereas, if he was working in an Enterprising occupation, the interaction would be considered incongruent.

There are many combinations of consistent, congruent and homogeneous types and models. However, it follows that the optimal combination of these characteristics are most conducive to (1) more stable vocational choice, (2) greater vocational achievement, (3) higher academic achievement, (4) better maintenance of personal stability, and (5) greater satisfaction (Holland, 1966a).

Holland's (1965) Vocational Preference Inventory (VPI) has been typically used to define personality types. However, in the past two
years Holland has developed the Self-Directed Search (SDS) (1971), an alternative instrument to operationalize his theory with broad application. Even more recently Holland and Campbell (1972) have applied Holland's theory to the data bank of the Strong Vocational Interest Blank and have devised two research scales which show promise of further operationalizing the theory.

Lacey (1970) and Gaffey (1972) have explored the concurrent validity of Holland's theory, using the VPI and the VPI, SDS and Holland Scales Sets I and II, respectively, with some positive and encouraging results. However, both of these studies were completed with populations of college graduates in the world of work. Thus, the question of the validity of Holland's theory for the non-college degreed population remains unanswered.

The purpose of the present study was to investigate the concurrent validity of Holland's theory of vocational behavior by administering the VPI and SDS to samples of non-college degreed persons who were well established in occupational environments representative of each of Holland's model vocational environments. The study attempted to determine if the two instruments which operationalize the theory for this sample in fact distribute the non-college degreed personnel groups in a comparable fashion according to their interests and perceived abilities. A secondary purpose of the study was to explore the relationships between same named scales for the VPI and the SDS.

Prior to presenting a more detailed statement of the problem, a review of the relevant research is presented in the following chapter.
CHAPTER II

REVIEW OF THE LITERATURE

Introduction

Whereas, research conducted by Holland and his associates has been comprehensive and has contained considerable duplication in the design of studies, investigations of Holland's theory by other researchers have been diverse and generally limited in nature. A literature review based on separate tabulations of studies would result in a disjointed and perhaps confusing presentation. Thus, the research has been grouped under the following categories: Investigations of the Personal Orientations and Their Influence, Investigations of the Environmental Orientations and Their Influence, Investigations of the Person and Environment Interaction, Investigations of Vocational Stereotypes as Related to Holland's Theory, Investigations of the Level Hierarchy, Classification Schemes for Vocations and Major Fields, and New Instruments.

Investigations of the Personal Orientations and Their Influence

Descriptions of the Model Personal Orientations.

In his theory of vocational choice, Holland isolates six model personal orientations (1959) as Realistic, Investigative, Artistic,
Social, Enterprising, and Conventional.

On the basis of a priori formulations, each type was given distinct characteristics formulating models against which real persons might be measured. Holland (1959, 1966a) believes that most persons within our culture can be categorized as one of these types. An essential step in verifying the theory has been to establish the empirical characteristics of these six typologies. Holland (1958) constructed the Vocational Preference Inventory (VPI) as a first step toward operationalizing the theory, and a considerable amount of the research substantiating the existence and characteristics of the model orientations has been conducted using this instrument.

In his quest to determine the empirical characteristics of the personal types, Holland has investigated the following domains: identifications with famous people, teacher-ratings, extracurricular activities and hobbies, self-ratings, personality variables, daydreams about vocational choice, aptitude, self-descriptions, coping behavior, competency and preferred activities, life goals, and interests. Correlates of the model orientations relating to identifications with famous people, teacher-ratings and extracurricular activities and hobbies were investigated by Holland (1962) using data from two assessment studies one conducted in 1958 on a sample of 783 male and 394 female high school seniors who were National Merit Scholarship

---

1The order of the model orientations presented here and in the remainder of this study corresponds to the hexagonal model found by Holland, el al. (1969) and used in the organization of his most recent instrument, the Self-Directed Search (Holland, 1972a).
Finalists. Holland found that students with different dominant personal orientations differ in the kinds of people they admire, although some famous people are popular with several classes. In the 1958 sample, teacher-ratings of speaking skills were related to the six types for males, and writing skills and drive to achieve were related for females. In the 1959 sample, teacher ratings of Citizenship correlated with the Investigative type for males, and Popularity and Social Leadership correlated with the Social type for males and females. Both hobbies and extracurricular activities differentiated males with different high-point codes, but only extracurricular activities differentiated the girls.

Using the 1958 National Merit Scholarship Finalist sample discussed above, Holland (1960) correlated the scales of the VPI scores with those of the Sixteen Personality Factor Questionnaire (16PF) and obtained 47 and 28 percent significant correlations for boys and girls, respectively. The data from this study provided some of the first empirical correlates of the personal orientations, and, in general, the correlations supported the a priori formulations of the models. Holland (1962) investigated personality variables related to the model orientations by correlating the scales of the VPI with the National Merit Student Survey (NMSS), a ten variable achievement inventory, and the 16 PF using a representative subsample of the 1958 sample of National Merit Scholarship Finalists; the full sample was used in the 1960 study. Again, Holland found the personality correlates of the 16 PF to be consistent with the personal orientations. Although less meaningful than the correlates with the 16 PF, Holland concluded that the
NMSS-VPI intercorrelations were consistent with expectations. Further personality correlates, using various scales from the Differential Reaction Schedule, the Inventory of Personal Philosophy and the Omnibus personality Inventory, were explored by Holland (1963a) with a sample of 592 Merit Finalists tested prior to college entrance and again at the end of their senior college year. Twenty-four of sixty correlations were significant. To generalize the findings beyond the highly talented population he had been studying, Holland (1968) tested the relationship between selected personality correlates and VPI scale scores for a more representative college sample once again finding expected relationships. Elton and Rose (1970) used factor scores of the Omnibus Personality Inventory (OPI) to discriminate among a sample of male college students classified by senior occupational choice into Holland’s categories, and they obtained results which provided further construct validity for the model orientations.

Aptitude as a correlate of personal orientations was examined by Holland (1963a) using the verbal and math scores of the Scholastic Aptitude Test (SAT). Realistic boys had low verbal aptitude, Investigative boys were characterized as having high verbal and math aptitude, Conventional boys had a tendency toward high mathematical rather than high verbal aptitude, and Enterprising boys seemed to have low math scores. Elton and Rose (1970) found that the American College Test (ACT) composite score differentiated between occupational categories. A mixed relationship between predicted and obtained correlations with some support for the theory was the result of a study by Harvey and Whinfield (1973). They examined the relationship between the
Differential Aptitude Tests scales and VPI high point codes for a sample of adult women enrollees in a college Continuing Education Program.

Holland (1968) also found that life goals differentiated the model types. The highest mean score for all groups was obtained by the Artistic type on producing artwork, by the Investigative type on developing scientific theory, and by the Conventional type on becoming an expert in finance and commerce. Although the Realistic, Social and Enterprising groups did not have the highest mean scores on the expected life goals, they were the second highest in the expected category.

The relationship of daydreams about vocational choice to the model orientations was examined by Holland (1962 and 1963a). In this domain he found similar results in both studies. Students with an Investigative orientation daydream about high achievement, creativity, and learning. Helping others is a typical daydream for students of the Social and Artistic types, and students, who are typed as Enterprising, daydream of success, status, and leadership.

Using another Merit Finalist sample, Holland (1963c) took a look at the relationship between self-descriptions and personal orientations. Adjectives from an adjective check-list, constructed by Holland, were correlated with each VPI scale for each sex. Results of this study showed the majority of adjectives to be associated with the personality types in a meaningful and descriptive manner. Bohn (1966) studied the relationship between male college students categorized into Holland's types from their SVIB results and psychological needs as operationalized by the Adjective Check List (ACL). He discovered a
relationship with at least five of the sixteen needs represented on the ACL with each type except the Social type. Folsom (1969) found for a sample of male and female college students that the Investigative male differed significantly from the Realistic male on the Liberalism scale of the College Student Questionnaire (CSQ); and that on the Cultural Sophistication scale the Artistic male differed from all other types except the Social male, who along with the Enterprising male differed from Realistic and Conventional males. Artistic females were differentiated by the Peer Independence scale from Realistic females. Enterprising and Artistic females were significantly different from Realistic females on the Cultural Sophistication scale. When male and female types were combined, all of the CSQ scales except the Family Social Status scale differentiated the types. Harvey and Whinfield (1973) in their study with adult women investigated the relationship between scales of the Edwards Personal Preference Survey (EPPS), the Allport-Vernon-Lindzey Study of Values (AVL) and the VPI. The following significant relationships were found: Realistic -- unsociable, theoretical; Investigative -- high achievement, low nurturance, low affiliation, theoretical; Artistic -- low order, high achievement, aesthetic; Social -- none; Enterprising -- high achievement, low nurturance, high change, low intraception, high exhibition, economic, unsocial, political; and Conventional -- low autonomy, economic, unsocial, not aesthetic.

In order to examine how persons in the different types would describe themselves in terms of their coping behavior, competencies and
activities, Holland (1963) administered a multiple-choice questionnaire consisting of nine items to a sample of National Merit Finalists, categorized into the model orientations by high point VPI scale. The responses for high scale scorers were in accordance with theoretical expectations except for a contradictory finding that Conventional boys indicated that they were most competent to perform artistic problems. Some of the findings for girls were not clearly interpretable within the theory's framework. In the 1968 study, Holland returned to an investigation of competencies and found that each type had the highest mean score in the competency expected to be associated with that type.

Self-ratings on seven traits were obtained from the students in Holland's 1962 study and on twenty traits from the students in Holland's 1963a study. As in the other domains, it was found that self-ratings discriminate among the personality types. Hughes (1972) had a sample of employed adult males rate themselves on a list of traits very similar to the list used by Holland (1963a). Only 6 percent of the sample rated themselves in accordance with Holland's model orientations.

Interest inventories have also been used to verify the existence of the model orientations. Wall, Osipow, and Ashby (1967) had male college freshman rank themselves on personality descriptions fitting Holland's types and found: "Not only do the personality types differ in their SVIB group scores, but, in many cases, the personality types have high group scores where they would be expected, and low ones where low scores would be expected" (p. 203). Cole and Hanson (1971) classified scales of the Strong Vocational Interest Blank, Kuder Occupational Interest Survey, Minnesota Vocational Interest Inventory, and
American College Testing Program's Vocational Interest Profile into the six Holland models and used correlation matrices of the scales in each of the interest inventories to see if the hexagonal arrangement of interests proposed by Holland, et al. (1969) is common to the other inventories. They found that the hexagonal arrangement was common from one inventory to another. Thus, further evidence of the model orientations' construct validity was provided. Cochriel (1972) correlated the scale scores of the basic interest scales of the SVIB for Women with the occupational scales of the VPI for a sample of female college freshman. Although the correlations were not as high as Cochriel thought they should be, the relationships, which were significant, show evidence supporting Holland's model descriptions. Lee and Hedahl (1973) performed a similar investigation with the SVIB basic interest scales and VPI occupational scales with a sample of male college freshman. Their results showed twenty-one of twenty-two $F$ tests to be significant and found appropriate differences between types on the basic interest scales. Harvey and Whinfield (1973) explored the relationship between the occupational scales of the SVIB for Women and the VPI and also obtained significant correlations on appropriate SVIB scales for women classified according to Holland's types.

Development of Personal Orientation

Holland (1962) and Barclay, Stilwell and Barclay (1972) have investigated the development of the personal orientation. "Since the theory assumes that persons with the same dominant personal orientations
have similar life histories and family backgrounds, these demographic variables should be related to the six types" (Holland, 1962, p. 14). Thus, Holland (1962) related the student's high point code to father's occupation, father's and mother's education, birth order, and family size as well as father's values and mother's attitudes. The findings of this investigation reveal that son's high point code is related to father's occupation but not parent's education, birth order or family size, while daughter's high point code was unrelated to these variables. Father's goals and income expectations for his child were also related to his personal orientation, e.g., father's of Realistic boys desire that their sons be ambitious and have high income; whereas, father's of Artistic boys want their sons to be curious and independent. Mother's attitudes did not present as clear a picture. Mothers of Conventional boys have the most authoritarian attitudes followed in decreasing order by those students in the Enterprising, Realistic, Artistic, Social, and Intellectual groups. Results for girls were similar. Barclay, et al. (1972) viewed the social interaction of elementary school children whose father's occupations had been classified according to Holland's classification system for occupations. From collected data, Barclay and his associates presented a series of vignettes of boys and girls whose father's occupations fell in the same or similar three digit codes, e.g., CBS, CRS, CRE. Characteristics of these children were generally those which would be expected of persons with the respective model orientations. Barclay and his associates concluded that the social interaction of this sample of boys and girls is generally related to the personality type of the
father, a finding similar to that of Holland in his 1962 study but with a much younger group.

Personality Types and Expected Performance

Given the personal orientation of an individual, certain predictions relating to his performance can be made. Generally these predictions have been in the area of vocational choice, job satisfaction, achievement, stability and creative performance.

Holland hypothesizes that persons seek environments which are congruent with their personality type. Holland (1962, 1963a and 1968) examined this hypothesis in his longitudinal studies. In 1962 Holland found that high school senior VPI high-point code had a predictive efficiency of approximately 33 percent when used to predict college major one- and two-years later. Holland (1963a) attempted to predict the senior year vocational choice and college major of this National Merit Finalist sample using Strong high-point codes obtained prior to college entry. Correct prediction of 28.6 percent for boys and 26.9 percent for girls was made for vocational choice, a prediction less effective than the base rate expectancy. Prediction of college major was slightly higher, 34.0 and 39.3 percent, respectively, for boys and girls. In this study Holland also used expressed choice to predict vocational choice and college major. Holland found that expressed choice was nearly twice as effective as VPI or SVIB high-point code in predicting future choice of vocation or college major. Holland's 1968 results using a more representative sample of college students,
supported earlier findings. Holland concluded that the definition of personal orientation by classification of a student's vocational choice yields predictions of subsequent choice which are superior to predictions using an interest inventory, SVIB or VPI, to type the student. Osipow, Ashby, and Wall (1966) predicted that students would choose occupations in categories consistent with the personality type they selected as most descriptive of themselves. Osipow and his associates asked a group of male and female college freshman to rate themselves with respect to personality descriptions based on the six Holland types. First, they ranked the descriptions, then, rated the descriptions on the basis of how well the descriptions described themselves. Comparison of vocational choice and first personality ranking showed that, for the Realistic, Investigative, Conventional, and Enterprising types, the choice categories were not randomly distributed. However, for the Conventional type most of the occupational choices fell into the Realistic and Investigative categories; a finding inconsistent with the theory. The subjects were divided into three groups, those with decided, tentative, and undecided college major, and a comparison between personality ratings and vocational choice was made for each group. In the decided group the Realistic, Social, Enterprising and Artistic groups rated the personality descriptions different from choice. There was no interaction between choice category and personality ratings in the tentative group, and the size of the undecided group was too small to obtain meaningful results. Osipow, et al., concluded that, even though a large proportion of students make occupational choices in a manner consistent
with Holland's theory, many do not. Elton and Rose (1970) attempted to predict senior occupational choice from freshman choice and personality and aptitude data for their sample of college males. In general, they obtained results quite similar to those found by Holland in 1968, i.e., as a predictor of subsequent occupational choice, expressed choice is much more effective than personality and ability scores. Analyzing their 1970 data from a different viewpoint, Elton and Rose (1971) took another look at the hypothesis that persons seek out environments similar to their personal orientation. If this is true, they reasoned that seniors who were vocationally undecided as freshman should not differ in personality or ability measures from seniors in the same major field who persisted in or immigrated to that major. They found no difference between the three groups. The results of these studies seem to indicate that, although Holland's hypothesis that persons seek out compatible environments may be correct, the instruments used to operationalize the personality orientations lack sufficient power to accurately and consistently categorize persons into the proper personal orientation.

Stability in Holland's theory is associated both with the dominant personal orientation and the arrangement of the types within the personal orientation. Holland (1962 and 1963a) found that the Realistic and Investigative orientations are associated with stability and the other orientations are associated with change. To test the hypothesis that Realistic and Investigative boys would have a more stable history of vocational choices than the remaining four types, Holland (1963e) had a sample of National Merit Finalists report all of the
vocational choices they could remember having made. For girls it was expected that the Social type would be most stable. The data indicated that for boys with a current choice of Realistic or Investigative the past modal choice was always Realistic or Investigative, whereas, for those with a current choice of Social, Conventional, Enterprising and Artistic, the past modal choice usually included Realistic or Investigative choices. The girl with a present occupational choice of Social generally chose vocations in the Social category in her earlier childhood. Girls in all other categories show greater variability in their past vocational choices. The category of first and second dominant types within an individual's personal orientation defines whether his profile is consistent or inconsistent, and Holland's theory indicates that the consistent individual is more stable than the inconsistent individual. Holland (1968) investigated this hypothesis and found no significant difference between consistent/inconsistent persons and their pattern of college major stability. Hughes (1972) using a sample of employed males investigated this hypothesis also and found no significant difference in the consistency/inconsistency of the personal orientations of the workers on the change no change dichotomy.

According to the theory, a person with a consistent personal orientation should achieve more and be more satisfied than one who is inconsistent. Frantz and Walsh (1972) found no significant difference with respect to satisfaction or achievement between college graduate students with consistent or inconsistent personal orientations. Hughes (1972), using the consistent/inconsistent dichotomy, found no significant difference in the satisfaction level of his employed sample;
and Foster and Gade (1973) found no significant difference in academic achievement between consistent and inconsistent male college freshman. Holland's definition of consistency has changed somewhat since the inception of his theory, and this presents some problem in interpreting the findings using this dichotomy. The first definition of consistency was based on a priori judgements of the compatibility of types. More recently (Holland, et al., 1969) the definition has been derived from the empirical findings of the hexagonal arrangement of categories. In this latter definition when the first and second dominant category occupy adjacent positions on the hexagon the personal orientation is determined to be consistent, and, when they are not adjacent, the orientation is inconsistent. Only Foster and Gade (1973) used this latter definition.

Summary

In this section, literature investigating the personal orientation and its influence has been reviewed. Although some mixed findings were evident, it appears that the empirical characteristics of the personal orientations have been sharpened for the male college student and somewhat crystallized for the female college student. Only one investigator, Hughes, (1972) sampled a population of working men, and his results were not supportive of the empirical characteristics found for college students. Development of the personal orientation has been largely neglected, but some promising results have shown up in the work of Barclay, et al., 1972. Predictions about the influence of the personal orientation were reviewed. Only three studies
have been accomplished in this area. Of these, Hughes' investigation
with a sample of employed males leaves some question as to the advisa-
bility of generalizing the theory to this population.

Investigations of the Environmental
Orientations and Their Influence

Holland (1966a) proposes that "...environmental models may be
defined as the situation or atmosphere created by the people who dominate
a given environment" (p. 52). "This idea implies that the character of
an environment is dependent upon the nature of its members, and that
the dominant features of an environment are dependent upon the typical
characteristic of its members." (Holland, 1966a, p. 53) Therefore,
one need simply know what kind of people make up a group to infer the
kind of climate the group creates. On this basis Holland reviewed a
United States Government study of four thousand jobs, sorted the occu-
pations into six categories and determined the typical characteristics
for each model environment. The models derived in this manner are
speculative formulations not empirical summaries. There appear to be
no studies conducted to verify the characteristics of the model
environments. The Environmental Assessment Technique (Astin and Holland,
1961) was developed to measure college environments. Astin and
Holland (1961) "assumed that the college environment... is a product
of the following attributes of the student body: the total number of
students in the college, the average intelligence of the students, and
the personal characteristics of the student body" (p. 308). However,
they give no information as to how these variables combine and, in fact, only use the proportional representation of each of the six model orientations to characterize the environment. Holland (1966a) indicates that a census of occupations, vocational preferences, or training preferences may be used to classify an environment.

Environmental Models and Expected Influence

Given an environmental model, certain predictions can be made about the influence of that model on people. As was the case with persons seeking environments which are compatible with their personality type, environments attract persons who are compatible with their model type. This section reviews research studies in which investigators have tested hypotheses generated from the influence of the environment.

One way to determine if the environment is attracting persons with personal orientations similar to the environmental model is to draw a sample from the environment(s) and see what types are there. Lacey (1971) sampled employed male subjects from seven professional occupational environments, Realistic -- project engineers; Investigative -- research chemists and computer programmers; Artistic -- college English and music professors; Social -- high school teachers; Enterprising -- bank executives and insurance executives; and Conventional -- actuaries, in order to investigate the concurrent validity of Holland's theory. Each subject took the VPI, and mean scores of persons in each of the six occupational categories were computed for all categories. A one-way analysis of variance revealed that the
Investigative, Artistic, Social, Enterprising and Conventional scales significantly differentiated the eight occupational groups. The chemist, high school teacher, actuary, and college English/music professor groups had the highest mean score in their corresponding personal orientation category; however, engineers and bank and insurance executives did not. Computer programmers who should have scored high on the Investigative scale, as did research chemists, fell behind engineers, actuaries, and college English/music professors. Of the non-vocational scales the masculinity and status scales significantly differentiated the groups and did so in accordance with Holland's theory. Lacey concluded that the data evidenced convincing support for the concurrent validity of Holland's theory. Gaffey (1972) conducted an investigation very similar to that of Lacey (1971). Gaffey obtained a sample of male college graduates from occupational environments as follows: Realistic -- industrial engineers; Investigative -- medical doctors; Artistic -- artists and art teachers; Social -- ministers; Enterprising -- insurance company and real estate salesman; and Conventional -- morticians. Each subject completed the VPI, Self-Directed Search (SDS), and Holland Scales, the latter two instruments are discussed in the new instruments section of this review. Analysis of data was similar to that done by Lacey (1971). The main effect for groups revealed that all scales of the Holland Scales, Set I and Set II, all scales of the SDS, five of the occupational scales of the VPI, and four of the non-vocational scales of the VPI differentiated the groups. A Tukey (b) test was accomplished on each of the above scales to see how the groups were differentiated. Results of this second test
showed that on the Holland Scales the Realistic, Artistic, Social, Enterprising and Conventional scales, on the SDS the Realistic, Artistic, Social and Enterprising scales, and on the VPI the Investigative, Artistic, Social, Enterprising, and Conventional scales differentiated the occupational groups consistent with Holland's personality types.

Apostal and Harper (1972) classified all of the college majors in the University of North Dakota Bulletin into the six environmental models and were able to obtain SVIB results on 203 male sophomores who had completed this test as freshman. Holland's Criterion List for Vocational Choices and Occupations (Holland, et al., 1969) was used to classify the Basic Interest Scales from the SVIB into the appropriate personal orientations. Mean scores for each of the six personal orientation groups were calculated for each of the environmental models and a one-way analysis of variance was accomplished on the data. Significant group differences were then submitted to multiple comparisons to identify the location of significance. The results of this comparison showed that the Investigative, Artistic, Social, Enterprising, and Conventional Basic Interest Scales differentiated the major field groups consistent with Holland's personality types. Although the Realistic Basic Interest Scales did not significantly differentiate the groups, the mean score of students in the Realistic major field was the highest of all groups on that scale. Eggenberger and Herman (1972) classified programs (college majors) at Southern Alberta Institute of Technology into Holland's environmental models, none were classified Conventional or Social. SVIB occupational group scores
for males in these programs were obtained and the subjects' mean scores in the following groups were computed: Realistic -- Group IV (Technical and Skilled Trades), Investigative -- Group II (Physical Sciences), Social -- Group V (Social Service), Conventional -- Group VIII (Business and Accounting), Enterprising -- Group IX (Sales), Artistic -- Group VI (Aesthetic-Cultural). Group scores were then rank ordered for each subject, grouped by college program, and compared with the model environments in accordance with a table of attractiveness as outlined by Holland (1966a). Results indicated that twelve of the thirteen Realistic model environments contained subjects exhibiting Realistic personality profiles. Three of five Enterprising environments contained subjects exhibiting Enterprising personality types. The Artistic environment contained subjects with Artistic personality codes, but none of the Investigative environments met the criteria. The statistical technique used in this study was particularly stringent, and the N's of the groups failing to meet significant requirements were of the smallest among the college programs.

Williams (1972) used subjects from college graduate school programs representing each of Holland's environmental models and administered the AVL, VPI, 16PF, and Miller Occupational Values Indicator (OVI) to each subject. Discriminant analysis was then performed for each instrument with the following results: for the VPI there was a range of appropriate personality types in the graduate school environments from 78 percent in the Investigative environment to 45 percent in the Realistic environment; for the AVL the range was 70 percent in the Investigative environment to 21 percent in the
Enterprising environment; for the OVI the range was 72 percent in the Social environment to 12 percent in the Enterprising environment; and for the 16PF the range was 73 percent in the Realistic environment to 46 percent in the Enterprising environment. Across the four instruments the purest groups were the Investigative and Conventional while the least pure groups were the Enterprising and Realistic groups. The VPI and the 16PF discriminated the groups most effectively, and this would be expected as much of the empirical data used to derive the characteristics of the personal orientations have come from these two instruments. General support is demonstrated in this study for the concept that environments attract individuals with personality orientations similar to the environmental model orientation.

Hughes' (1972) approach to the investigation of the environmental attraction hypothesis is a little different. His subjects came from two hundred and thirty-nine different occupations and were classified into environmental model groups according to Holland's system. They were administered the SVIB, VPI, 16PF, and a Self-rating instrument devised by Hughes. Subjects' personality orientations were determined separately for each of the four instruments. Within the SVIB the personality orientation was determined by highest SVIB scale, high group, and high scale within appropriate group, therefore, providing six different methods for determining personality orientation. Personality orientations on each of the six measures were then compared with the occupational environment which the individual had selected. Using SVIB high scale, 14 percent of the employed workers had appropriate personal orientations for the environment in which they worked;
using SVIB high group, 33 percent had appropriate personal orientations; using high scale within appropriate group, 35 percent had appropriate personal orientations; using VPI, 42 percent had appropriate personal orientations; using 16 PF, 23 percent had appropriate personal orientations; and using Self-ratings, 6 percent had appropriate personal orientations. Hughes concluded that these results partially support Holland's theory. The low classification resulting from the 16 PF and the Self-ratings may be due to Hughes' rather rigid criteria for classifying subjects into personal orientations based on these instruments.

Hogan, Hall and Blank (1972) investigated the similarity-attraction hypothesis, and their results evidence support for the contention that environments attract individuals who have personality types similar to the environmental model. These investigators had male college students respond to a custom-made interest measure, thirty activity preference items written to represent each of Holland's categories (five per category). Subjects were divided into three groups, and four weeks after responding to the interest measure, Group I was given an answer sheet which precisely agreed with their own, Group II was given an answer sheet in which there was a fifty/fifty mix of agreement, and Group III received an answer sheet which totally disagreed with their own. Subjects were asked to show their attraction to the person whose answer sheet they had been given. A one-way analysis showed significant difference between groups. These results are interpreted to mean that persons are attracted to others with similar interests. Since the environmental influence is characterized as being the attraction to persons with similar interest, this study shows further
Environmental influence may also be viewed from the standpoint of how it affects the individual over time. Holland proposes a developmental growth of the personal orientation. Astin (1965) explored this notion by testing the hypothesis that "...during college the student's vocational choice comes to conform more and more to the dominant or modal choice in his college environment" (p. 28). Astin used a large sample of National Merit competitors who were polled for data at entrance to college and again near graduation from college. The student's final-career choice was classified into Holland's system; Conventional and Artistic were not included because of small sample sizes in these fields. Colleges attended by the subjects were classified according to the EAT procedure. Input variables, freshman college major choice, vocational choice, aptitude scores, etc., were controlled by entering them into a step-wise multiple regression analysis before permitting the environmental characteristics to enter the equation. The results showed only the Realistic and Enterprising environments to be influential. Walsh and Lacey (1969 and 1970) and Walsh, Vaudrin, and Hummel (1972) investigated this hypothesis in a series of cross-sectional studies which tapped the student's self-report of the perceived impact of the college environment. For male college seniors (Walsh and Lacey, 1969), they found that the appropriate group was significantly differentiated for the Artistic and Investigative scales of their research instrument, a measure containing six scales with attributes of each Holland type. Although not significant, the Realistic group had the highest mean score on the Realistic scale. For college senior
women, the results showed that the Investigative, Artistic and Conventional college major groups perceived themselves as having moved in a direction consistent with the corresponding personality types.

The final study in this group (Walsh, et al., 1972) tested the environmental influence over a much shorter period, three college quarters.

Walsh and his associates found that, although the Investigative and Artistic scales differentiated the male groups, and the Investigative and Conventional scales differentiated the female groups, only the male students in Investigative and Artistic college majors perceive themselves as moving in the appropriate direction. "In general, in the areas of significance identified in this study the senior groups when compared to the freshman groups seemed to report more change in a direction consistent with their dominant personality orientation(s) expressed via their college-major choice" (Walsh, et al., 1972, p. 8).

Holland (1966a) asserts that the environment presses the individual to assume differentiated roles, e.g., a Social environment most frequently demands that a person assume the role of practitioner while the Investigative environment makes a research press on the individual. In a fashion, a study by Osipow (1970) sheds some light on this assertion. Osipow asked clergy men and seminary students to respond to the VPI and a work role check-list, this list contained eight roles which had been identified with one of the following Holland categories: Artistic, Social, Investigative, Enterprising and Conventional. VPI high point codes of the respondents were then compared to their work role, and on this basis, the most accurate prediction was that practitioners were most likely to have a social orientation which
is consistent with Holland's theory. Holland also draws on the second type within the personal orientation as a predictor of work role within an environment, however, Osipow did not include a discussion or show results of such an analysis.

Another area of environmental influence is related to stability of choice and here Holland (1966a) assumes that the individual will be most stable when he is in a consistent, homogeneous environment. This assumption was tested, in part, by Holland in his 1963a and 1968 studies. Holland (1963a) hypothesized that "...when colleges are classified as having consistent or inconsistent codes and when students are classified as changers or non-changers, stability will be associated with consistent college codes" (p. 566). The results of the test of this hypothesis showed a borderline, (p < .10), support for boys and no support for girls. In 1968 Holland tested the homogeneity counterpart of the consistency hypothesis. An institution's homogeneity was determined by computing the percentage difference between the largest and smallest EAT score. Separate correlations were computed for each male and female group in each of the two populations. The results of the test of this hypothesis yielded only one significant correlation between stability of college choice for males and females and homogeneity. The other three correlations were positive and support the hypothesis but were not significant.

Summary

In this section research literature has been reviewed which investigated the environmental orientations and their influence. No
research studies were found which attempted to validate the subjective characteristics of the model environments. Considerable research regarding the concurrent validity of the theory has been accomplished, and this aspect of the theory has been validated on samples of college students, graduates and undergraduates, and college graduates in the world of work. However, Hughes' (1972) study of employed males failed to support the concurrent validity of the theory. Environmental influence in terms of the developmental change of the personal orientation, occupational role, and consistent/inconsistent and homogeneous/heterogeneous effects were also reviewed.

**Investigations of the Person and Environment Interaction**

Interactions between the person and the environment may be viewed from the standpoint of congruence, consistency, homogeneity or any combination of these concepts. Holland (1966a) believes "...that more precise predictions about human behavior can be made by assessing both the person and the environment...." (p. 72).

**Consistency and person-environment interaction**

Holland (1963a) conducted an investigation of the prediction that a person with a consistent personal orientation in a consistent environment will be more stable and achieve better than a person with an inconsistent orientation in an inconsistent environment. Separate hypotheses were tested for stability and for achievement. For college males' major field choice, Holland found that "the consistent student-
consistent college interaction is related to maximum stability and the interaction of inconsistent student and inconsistent college has minimum stability" (p. 568). When examining the stability of vocational choice of college males, Holland found support for the hypothesis only in terms of maximum stability for the consistent student in a consistent college environment. Various combinations of consistent/inconsistent persons with high and low scientific achievement in consistent/inconsistent environments were compared to test the consistency - achievement hypothesis for women. The results showed a significant difference only for that group of consistent women with low scientific achievement in consistent and inconsistent colleges.

Congruence and person-environment interaction

The congruence/incongruence dichotomy has been investigated by several researchers as it relates to stability of college major, vocational choice, personal adjustment, achievement, and satisfaction. Holland (1963a) found that artistic and leadership achievement is greater for boys when they attend colleges which are congruent with their personal code but that this relationship does not hold true for girls or scientific achievement.

Walsh and his associates (Walsh and Russel, 1969; Walsh and Barrow, 1971; and Walsh and Lewis, 1972) have investigated congruent/incongruent interactions and their relationship to personal stability and adjustment. In order to test the congruence-personal adjustment hypothesis, Walsh and Russel (1969) had college students complete the VPI and Mooney Problem-Checklist. A student was determined to be
congruent if his VPI high scale score and college major were of the same category and incongruent if they were not. Analysis of variance was used to determine the main effect for groups, and the results were significant. Through the use of the student's t-test, the significant result was further examined showing that the congruent male group reported fewer adjustment problems. Analysis of the female congruent group showed similar but insignificant results. In two similarly designed studies Walsh and Barrow (1971) and Walsh and Lewis (1972) examined the relationship between congruence and personal stability. As in the Walsh and Russel (1969) study, congruence was defined using the college students' high-point code and choice of college major. Four groups were constructed, congruent and incongruent male and female groups. In the 1971 study the California Psychological Inventory was used to measure personal stability, and the analysis of variance revealed no difference between congruent and incongruent groups. However, in the 1972 study the OPI was used to measure personal stability, and the analysis of variance showed that the groups differed on Impulse Expression, Personal Integration, Anxiety Level and Response Bias. Under examination of the Tukey (b) test the congruent male group was found to be significantly different from the incongruent male group on the personal Integration scale. No explanation was given for the apparent contradictory results of this study and the study of Walsh and Barrow (1971).

Holland (1968) investigated the effect on satisfaction of congruent/incongruent person-college interaction over eight and twelve month periods and found no relationship between the two for men but a
positive relationship between congruence and satisfaction for women. Morrow (1971) examined the congruence-satisfaction hypothesis separately for two of Holland's types: Investigative -- upperclassman in college math and Social -- upperclassman in college sociology. Subjects were assigned to one of the six personality types on the basis of their VPI results. Within each environment, math and sociology, the students with the same type as the environmental model were designated congruent, and the remainder were designated incongruent by type; thus, there were six groups in each environment. For example, in the mathematics environment the six groups were: congruent-Investigative, incongruent-Realistic, incongruent-Artistic, etc. In the Investigative environment the congruent-Investigative group was significantly more satisfied than the incongruent Social, Conventional, Enterprising, and Artistic groups. The difference between the Investigative and Realistic groups was in the appropriate direction but not significant. There was no significant difference between the congruent-Social group and the incongruent groups in this environment. Frantz and Walsh (1972) found no difference in satisfaction between congruent and incongruent college graduate students. The results of these three studies indicate that, when subjects are lumped together across types as congruent or incongruent, significant differences become submerged but, taken by type within environments, differences may be more appropriately explored.

In his first investigation of the congruent-occupational stability hypothesis, Holland (1962), because of small cell sizes, grouped students into science and non-science environments and defined congruent subjects as those in the science environment with an Investigative or
Realistic high-point code and those in non-science environments with an Artistic, Social, Enterprising or Conventional high-point code. The test for stability in major field revealed no difference between congruent and incongruent subjects. Holland's (1963a) next study also investigated this hypothesis. However, in this study, congruence was determined by comparing the college environment, as classified by EAT, and student high-point code, as classified by SVIB. A change of vocational choice occurred if there was a difference between freshman choice and senior choice, and the difference reflected different types; change of major field was determined in the same fashion. For boys, the difference between congruent and noncongruent students on change of vocational choice was marginally significant. (p .10) and the change of major field reached a significance level of 95 percent. These results imply that congruence is related to stability. Holland and Nichols (1964) tested the hypothesis that students who remain in a field of study will resemble the typical student in that field, whereas the student who leaves the field of study will be unlike the typical student in that field. A sample of National Merit Finalists was classified into Holland's categories by pre-college major field preference. Preference for major field at the end of the freshman year was compared to initial preference to determine change. The student was classified as a non-changer if both preferences were in an identical field, an intra-class changer if first and second preferences were different but in the same type, and an interclass changer if first and second preference were of different types. The subjects were measured on a variety of personality variables. Results of the correlation
of the personality variables with changers in each type reflected general support for the hypothesis that persons who change major field are unlike those who stay (incongruent). In 1968 Holland returned to an investigation of the congruence-stability hypothesis. From the results of this study, he concluded that the evidence was in favor of the congruency hypothesis. Gilbride (1973) in an investigation of active and resigned clergy found a marked similarity between the two groups' VPI profiles. Both active and resigned priests had the same two-digit high-point, consistent personal orientation -- Social-Artistic. This result is somewhat similar to that found by Morrow (1971) who found no difference in satisfaction between congruent/incongruent groups in the Social environment.

To examine stability in terms of the rather static concept of change or no change connotes movement without direction. Holland's theory provides the basis for predicting the direction of change both in the concept of congruence and in the concept of psychological compatibility as defined in the hexagonal arrangement of types. In the first instance, the prediction would be that given an incongruent person-environment interaction the person will change toward a more congruent environment. Should the individual be in a congruent environment and have to change due to lack of ability, finances, etc., then, according to Holland's hexagonal model, one would predict that the person would move to an environment adjacent to his type. Holland (1963a) examined the direction of movement of students choice of field to determine if changers moved to more congruent fields. Holland's data showed that 25.8 percent of the male changers and 45.4 percent of
the female changers moved to a second field which was congruent with their high-point code. In both cases the correct predictions were significantly greater than that expected by chance. However, simple arithmetic shows that 74.2 percent of male changers and 54.6 percent of female changers did not move in a more congruent direction. In fact, 24.7 percent of the males and 15.1 percent of the females left a congruent environment for a less congruent environment.

Elton and Rose (1970) found that immigrants to the Holland environments were not differentiated fromPersisters in those environments by personality and aptitude criteria. Thus, further support was provided for the notion that changers seek more congruent environments. These investigators also examined the following hypothesis: "...students emigrating from Artistic choices to Intellectual and Social choices would differ in personality attributes from Artistic students emigrating to Realistic, Conventional, and Enterprising choices" (p. 16). This is a test of student change based on Holland's hexagonal model, Intellectual and Social environments are adjacent to the Artistic environment while Realistic, Conventional, and Enterprising environments are more remote. Discriminant analysis revealed that these two groups of emigrants differed significantly on the variables of Scholarly Orientation and ACT Composite with the ACT Composite contributing the greatest to the variance between the two groups. Elton and Rose concluded that students who change may elect their final choice on the basis of ability rather than personality variables.
Summary

In this section research literature was reviewed investigating the interaction of the person and the environment. Primary attention was given to testing hypotheses generated from congruent/incongruent interactions. The results of these tests have provided mixed support for the theory. Of significance is the fact that all of the studies conducted in this area have used samples of college students.

Investigations of Vocational Stereotypes as Related to Holland's Theory

One of the underlying assumptions of Holland's theory is that people hold stereotypes of the typical person in a given occupation and that these stereotypes have a degree of accuracy in that they accurately reflect psychological characteristics possessed by persons in the occupations. Holland (1963b) obtained images, or stereotypes, of six vocations by asking National Merit Finalists to complete sentences such as "Physicists are ____," for six occupations representative of his six types. Separate tables for male and female responses were compiled for each occupation listing the adjectives used in the order of their frequency. By inspection of the tables, Holland concluded that students of superior aptitude perceive occupations in stereotyped ways and that the stereotypes tend to be consistent with some of the personality variables associated with these occupations from previous research.

Hollander and Parker (1969 and 1972) conducted two investigations of occupational stereotypes using occupations categorized into Holland's types. Samples of middle-class high school sophomores were used in
both studies. In the first study, Hollander and Parker used fifteen selected Adjective Check List need scales to measure students' stereotypes and checked the consistency of the stereotypes with Holland's orientations by translating each orientation into need terms. Results substantially confirmed the stereotypes for scientist, bank teller, and business executive, partially confirmed the artist and teacher stereotype, but failed to confirm the stereotype for auto mechanic. These findings support the existence of occupational stereotypes and partially confirm their content with relation to Holland's types. In the second study, the Adjective Check List was again used. Each subject described himself, and, in a later session using the same scales, described his conception of his most and least preferred occupation. On thirteen scales significant correlations were found between self-descriptions and descriptions of preferred occupations. Only two scales were significantly correlated between self-descriptions and least preferred occupations, and one of these correlations was negative. Only one subject selected his most and least preferred occupation from the same Holland category. This study supports the conclusion that occupational choice of high school students is influenced by the degree of positive relationship between their self-concepts and the occupational stereotypes they hold (Elmendorf, 1972).

Elmendorf (1972) had college students respond to the VPI as themselves and as a research chemist, high school teacher, or college English professor/music instructor. Subjects were divided into three groups according to the occupational group they were asked to simulate. The students' VPI responses were first compared, using discriminant
analysis, with their responses for research chemist, high school
teacher, or college English professor/music instructor. Elmendorf
found: (1) the three groups responding as themselves could not be
differentiated using the occupational scales of the VPI; (2) subjects
responded differently when answering for themselves than when they
answered as they thought one of the specified occupational group members
would respond; (3) the responses of the three simulated groups were
discriminated by the VPI occupational scales. These findings reveal
that college students hold stereotypes of research chemists, high
school teachers, and college English professors/music instructors,
and the stereotypes are different for different occupations. Student
responses simulating one of the specified occupational groups were
then compared with the responses of actual members of the specified
groups. The student responses were discriminated from the actual
members of the occupations revealing that the stereotypes held by
college students of research chemists, high school teachers and
college English professors/music instructors were inaccurate.

All four of the studies in this section evidence support for
Holland's contention that students hold stereotypes of the typical
person in a given occupation. However, there is some uncertainty
introduced by Elmendorf's results as to how accurate those stereo-
types are. Since there is no measure of the degree of inaccuracy in
her study, one must withhold judgement on the affect of this finding
on Holland's theory.
According to Holland's theory a person's choice of occupation is a function of his personal orientation, but the occupational level at which one is found is a function of intelligence and self-evaluation. Holland defines self-evaluation as the relative worth an individual ascribes to himself. Instruments such as the Occupational Level scale of the SVIB or Sims Social Status Scale were recommended for measuring these two variables.

In his 1962 study, Holland tested the level hierarchy formulation by predicting a relationship between the student's college major and the sum of his score on the VPI Status scale and SAT Math score. Certain college majors have been found to require more intelligence than others, and Holland expected subjects with the highest level hierarchy score to choose the more demanding majors. Students were classified into nine categories depending upon into which third of the sample their status and SAT Math scores fell, e.g., 1-1 indicated a student with status and intelligence scores in the top third of the subjects. Although the general trend of the data supports the hypothesis, the level predictions for girls are more in keeping with expectation than those for boys.

One of the first studies reported after the publication of Holland's theory was conducted by Schutz and Blocher (1961). They tested Holland's assumption that the SVIB Occupational Level score is a valid index of an individual's self-evaluation. All of the male seniors of a suburban high school were administered the SVIB and
reported self and ideal-self descriptions on an instrument designed by the authors to measure self-satisfaction. Schutz and Blocher believed that, if the OL scale of the SVIB was an accurate measure of self-evaluation, then it should have a high positive relationship to the student's self-satisfaction. A product-moment correlation of 0.34, significant beyond the 0.01 level, between the Occupational Level and self-satisfaction scores was obtained. Thus, they concluded that the SVIB OL score could be used to measure self-evaluation.

Two investigators have used Holland's formula to predict occupation level. Stockin (1964) used a sample of high school senior boys to determine how well level of vocational choice could be predicted from the sum of intelligence and self-evaluation. IQ scores from school files provided the intelligence data. Self-evaluation scores were obtained by averaging quartile ranks of scores on the Sims Social Status Scale, the Attitude Toward Education Scale and the Socio-economic Expectation Scale. IQ scores were also assigned a quartile rank. The occupational level score of each subject was obtained by computing the average of the IQ and self-evaluation quartile rank scores. Occupational level scores were then compared to the subject's vocational choice level which had been classified according to Roe's system (1956). Stockin's predictions of subjects' vocational choice level were significantly different from chance expectation. Most of the predictions which were incorrect were off by only one level. Hughes (1972) used the Quick Word Intelligence Test (QW), the Sims Occupational Rating Scale (Sims), and SVIB OL to predict the occupational level of a sample of employed males. Subject's scores on the three instruments
were converted to top, middle or bottom third of all scores within the sample. The two self-evaluation scores (Sims and SVIB OL) were averaged and this score was then averaged with the intelligence score (QW) to give the predicted occupational level. Occupations of the subjects were classified into a compressed Roe system (1956); levels 1 and 2, 3 and 4, and 5 and 6 were combined to give three levels. Predicted occupational levels were compared to actual levels yielding a highly significant level of accurate prediction.

The four studies reviewed in this section provide considerable support for Holland's level hierarchy. The studies of Stockin (1964) and Hughes (1972) are limited because of their cross-sectional nature. As Stockin pointed out for his study, the predictions are actually postdictions.

Classification Schemes for Vocations and Major Fields

Although the Environmental Assessment Technique (Astin and Holland, 1961) was developed to give the practitioner or researcher a means of classifying environments, the impracticability of having to use this technique to type all of the possible environments a person may enter becomes patently obvious. Thus, Holland (1966b) devised a method where by the classification of vocations and major fields could be obtained from normative tables. Vocational choice, college major choice and VPI profiles were obtained for 5600 male and 5560 female college freshman. Using the six occupational scales, Holland calculated average VPI profiles for students aspiring to each
vocation and each college major. Vocations were first assigned to one of the six vocational categories depending upon the highest average VPI scale obtained by its aspirants, and, then, assigned to subgroups within a vocational category depending upon the second and third highest average VPI scale scores of its aspirants. Separate tables of the results of these classifications were provided for male vocations and for female vocations. Men's classifications and subclassifications covered the range of categories, but there were no vocations classified as either Realistic or enterprising for women. Using this classification system Holland found: (1) the classification developed from one sample produced expected results when applied to another sample; (2) students grouped into the six categories according to their occupational choice had the highest mean score on the appropriate VPI scale; and (3) female vocational choices are distributed more evenly across categories when the Social category is subtyped. The third finding resulted in seven classifications for women: Investigative, Artistic, Social-Investigative, Social-Conventional, Social-Enterprising, Social-Artistic, and Conventional.

A somewhat serendipitous finding by Holland and his associates occurred while inspecting an intercorrelation matrix of the VPI scales. Holland, Whitney, Cole, and Richards (1969) found that the intercorrelation matrix for the VPI occupational scales could be approximated by the distances within a hexagon. Thus, the hexagonal model shown in Figure 1 has been used to revise the vocational classification system. For this revision, VPI data for a large sample of two-year college students and for some samples of employed adults were
Figure 1: A Hexagonal Model for Interpreting Inter- and Intra-Class Relationships

added to the 1966 data. Occupations were assigned to major categories using the same procedure as Holland used in 1966. However, the arrangement of the major categories and subcategories was accomplished to conform to the hexagonal model. Major categories are arranged to follow in this sequence: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Subcategories are arranged so that the second code letters follow in clock wise order starting from the major category's code. For example, the arrangement of Realistic-Social (RS), Realistic-Investigative (RI), Realistic-Conventional (RC), Realistic-Enterprising (RE), and Realistic-Artistic (RA) would be: RI, RA, RS, RE, RC. Cole, Whitney and Holland (1971) have extended the hexagonal arrangement of the six vocational scales to the location of individuals and occupational groups. Viernstein (1972) used Bayesian statistics and the definitions of occupational groups in two separate methods which have extended Holland's occupational classification
to all occupations in the *Dictionary of Occupational Titles*.

**New Instruments**

In 1971 Holland reported the development of a new instrument for use with his theory. "The Self-Directed Search is a self-administered, self-scored, and self-interpreted vocational counseling tool" (p. 167). This instrument is a result of much of Holland's earlier research. For instance, its components include sections which deal with Occupational Daydreams, Activities, Competencies, Occupations, and Self-estimates. A more detailed description of this instrument and its reliability is contained in Chapter III.

Holland and Campbell (1972) have reported on the development of two research scales which attempt to integrate the work of Holland (1966a) and Strong (1943). The first set of scales, Set I, consists of 14 SVIB items for each of the six categories in Holland's theory and can be used with any form of the Men's SVIB ever published. The second set of scales, Set II, consists of 20 SVIB items for each of the six categories in Holland's theory and can be used only with the revised SVIB. The relationship of the Holland Scales to the existing scales of the SVIB is described by Holland and Campbell as follows:

"The Holland scales are parsimonious and give a general picture, the Basic Interest scales are homogeneous and provide measures of the strength in specific areas of interest, the Occupational scales offer an immediate tie between the individual's pattern of interests and those of men in specified occupations" (p. 375).

Hansen and Johansson (1972) used the same methodology as Campbell and Holland to devise Holland scales for the Women's SVIB.
Although the Holland scales will be useful primarily for persons considering professional occupations, the SDS has been developed to apply to persons from six to sixty for any occupation or occupational level.

Summary

As is evident from this review, considerable research has been conducted testing the hypotheses and examining the constructs of Holland's theory. Many contradictory findings have caused Holland to revise his theory, and he has readily done so where his studies and those of his associates have demonstrated this necessity. Some of the contradictory and supportive findings from the research of others has also been integrated into Holland's theory. Unfortunately the changes to Holland's theory lie scattered about both in published and unpublished studies. A systematic integration of the research is sorely needed, and, perhaps, Holland (1973, in press) will provide just that in the restatement of his theory.

From the data included herein, one may generally conclude, despite some contradictory and some unclear findings, that Holland's theory has considerable construct, concurrent and some predictive validity for talented males in our society. Less confidence can be placed in such a statement for talented females. From the very limited number of studies conducted using samples of non-college degreed persons, one can only reserve judgement, for the present, in regard to the theory's applicability for this group.
CHAPTER III

METHODOLOGY

Sample

The sample for this study consisted of a total of 126 male non-college degreed workers drawn from six occupations corresponding to each of Holland's environmental classifications. Occupations were selected from The Occupations Finder (Holland, 1972b) on the basis of their classification and required education level. In this booklet, occupations are grouped according to their three digit classification code, and the level of general educational development an occupation demands is coded 1 to 6. Level 1 is equated with an occupational requirement of elementary school training or less; and level 6 is equated with an occupational requirement of college training. Occupations requiring a level 3, high school, technical or business training, were selected for this study. The six occupational groups and distribution of subjects in these groups were: (1) Realistic - barbers (N=20); (2) Investigative - electronic technicians (N=26); (3) Artistic - photographers (N=18); (4) Social - bartenders (N=15); (5) Enterprising - gas station managers (N=20); and (6) Conventional - accounting clerks (N=27). Subjects were exclusively male because Holland's theory and instruments have been demonstrated to be more clearly valid for males than for females. Subjects ranged in age from 20 to 70 years; had been
<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>Barbers (N=20)</th>
<th>Electronic Photographers (N=26)</th>
<th>Photograpers (N=18)</th>
<th>Bartenders (N=15)</th>
<th>Gas Station Managers (N=20)</th>
<th>Accounting Clerks (N=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Years in present job:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>11.2</td>
<td>11.3</td>
<td>8.2</td>
<td>9.9</td>
<td>9.2</td>
<td>6.6</td>
</tr>
<tr>
<td>Range</td>
<td>1-40</td>
<td>1-26</td>
<td>1-25</td>
<td>1-35</td>
<td>1-35</td>
<td>1-31</td>
</tr>
<tr>
<td><strong>Age:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>35.2</td>
<td>39.9</td>
<td>41.4</td>
<td>44.6</td>
<td>35.4</td>
<td>40.8</td>
</tr>
<tr>
<td><strong>Education level:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-6</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7-9</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>10-12</td>
<td>15</td>
<td>16</td>
<td>6</td>
<td>8</td>
<td>15</td>
<td>8</td>
</tr>
<tr>
<td>Some college</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>10</td>
</tr>
<tr>
<td>1-2 years college</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td><strong>No. of other jobs held:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>5</td>
<td>7</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>One</td>
<td>4</td>
<td>8</td>
<td>7</td>
<td>4</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Two</td>
<td>3</td>
<td>5</td>
<td>0</td>
<td>3</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Three</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>More than three</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>No response</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
TABLE 1 - Continued

<table>
<thead>
<tr>
<th>Demographic Characteristics</th>
<th>Barbers (N=20)</th>
<th>Electronic Technicians (N=26)</th>
<th>Photographers (N=18)</th>
<th>Bartenders (N=15)</th>
<th>Gas Station Managers (N=20)</th>
<th>Accounting Clerks (N=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In this occupation by:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan</td>
<td>9</td>
<td>3</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Chance</td>
<td>4</td>
<td>8</td>
<td>9</td>
<td>8</td>
<td>14</td>
<td>10</td>
</tr>
<tr>
<td>After considering others</td>
<td>5</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>9</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Future plans:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thinking of changing</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Don't know</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Probably stay</td>
<td>7</td>
<td>9</td>
<td>7</td>
<td>6</td>
<td>9</td>
<td>18</td>
</tr>
<tr>
<td>Retire from this job</td>
<td>11</td>
<td>14</td>
<td>10</td>
<td>6</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
employed in the occupation for a minimum of one year; and had not com­
pleted more than two years of college. A summary of the demographic chara­
teristics of the sample can be found in Table 1. The sample was ob­tained in two geographic locations, Columbus, Ohio and Charleston, South Carolina. One barber, nine electronic technicians, four photograph­ers, two bartenders, two gas station managers, and nine accounting clerks were taken from occupational environments in Charleston and the remainder of the sample was obtained in Columbus.

Two hundred and fifty sets of questionnaires were passed out to sub­jects who volunteered to participate in this experiment. Of this group, the following indicates their participation in the study: 126 usable responses; 15 incomplete responses; 11 were returned unanswered; 28 were returned by persons with more than two years of college; 6 were returned by women; 3 were returned by persons with less than a year in the occupation; 4 were returned too late to be included in the study; and 57 were not returned.

Instruments

Each subject in the experimental sample completed a biographical data sheet (Appendix A) which included: job title, length of employment, age, educational level, other jobs held, method of selecting present job, and plans for the future. On the basis of information provided, respondents who were employed in the occupation for less than one year and/or had completed more than two years of college were eliminated from the sample. Most of the data gathered on this questionnaire was obtained solely for demographic descriptions of the sample.
All subjects responded to the Vocational Preference Inventory, sixth revision (Holland, 1965). This instrument, described by Holland (1966a) as a personality inventory, consists of 160 occupational titles to which the respondent indicates like for those occupations which appeal to him and dislike for those occupations which are not appealing. Occupations for which the respondent is indifferent receive no response. The 160 occupational titles make up eleven scales: Realistic, Intellectual, Social, Conventional, Enterprising, Artistic, Self-control, Masculinity, Status, Infrequency, and Acquiescence. The first six scales serve as operational definitions of the model personality orientations which were summarized in Chapter I. The pattern of scores on these six scales constitute the respondent's personality profile from which the presence or absence of specified interests, values, self-conceptions, preferred ways of relating to others, and coping behaviors may be inferred. Fourteen non-overlapping items, the best discriminators from the test's fifth revision, make up the six vocational scales and the Self-control, Masculinity, and Status scales. The Acquiescence Scale (high scores indicate a tendency to answer favorably in an indiscriminate manner; low scores suggest rejection of the occupational world) has 30 items. And, the Infrequency Scale (high scores represent making unusual or unpopular choices) has 20 items.

The basic rationale underlying this instrument is that in responding to occupational titles the individual projects aspects of his personality organization which is partly based on the occupational stereotypes which he holds and partly based on his experiences and personal style. Therefore, on the basis of the individual's pattern of
likes, dislikes and knowledge of occupations, the Vocational Preference Inventory allows the classification of individuals into personality types consistent with Holland's theory.

Reliability data presented in Holland's Manual (1965) based on a large group (N=6289) of male college freshmen, reveal the following reliability coefficients (Kuder-Richardson 21) measuring internal consistency: for the Realistic scale, .85; Intellectual, .89; Social, .84; Conventional, .87; Enterprising, .83; and Artistic, .88. Six week test-retest reliability for a small sample of college seniors (N=17) containing both males and females were, in the same order as reported above: .92, .83, .79, .74, .78, .98. When the retest interval was extended to one year, using a sample of male and female college freshman (N=26), the reliability coefficients were: .88, .65, .76, .61, .71, .73. Evidence of the Vocational Preference Inventory's validity has been reviewed in Chapter II.

The third instrument completed by all subjects was the Self-Directed Search (Holland, 1972a). The Self-Directed Search is a self-administered vocational planning instrument consisting of two booklets, an assessment booklet and an occupations finder booklet. This inventory is an extension of the Vocational Preference Inventory and is the result of Holland's exploration into the various correlates of the personal orientations. The Self-Directed Search assessment booklet is organized in terms of the six personality orientations. The individual's responses on separate sections for Activities, Competencies, Occupations, and Self-Ratings (referred to as domains) are combined in the Summary section to determine his personality type. In the assessment booklet
The domains, scales, and items are arranged in the following way:

- **Activities**: Six scales of 11 items each. The respondent indicates his preferences for the activities listed.

- **Competencies**: Six scales of 11 items each. The respondent rates his ability on the skills listed.

- **Occupations**: Six scales of 14 items each. The respondent indicates his preference for the occupations listed.

- **Self-Ratings**: Two sets of six ratings, each rating corresponding to a type. In the first set (SR 1), the subject rates himself on a scale from 1 to 7 on mechanical, scientific, artistic, teaching, sales, and clerical ability. In the second set (SR 2), the ratings are on manual skills, math ability, musical ability, friendliness, managerial skill, and office skills. (Edwards and Whitney, 1972).

To obtain the individual's personality type, the three highest scores from the five domains are multiplied by 3, 2, and 1, respectively, then summed across the six types.

Reliability data presented in Holland's *Manual* (1972a) based on a sample of 358 men reveal the following reliability coefficients (Kuder-Richardson 20) measuring internal consistency: Activities - Realistic, .84; Investigative, .77; Artistic, .73; Social, .63; Enterprising, .78; Conventional, .79; in the same order, Competencies - .83, .72, .71, .71,
.75, .69; and Occupations - .77, .86, .87, .84, .83, .88. Retest reliability for a small group of high school boys (N=118) over a 3-4 week interval were: .81, .87, .49, .68, .54, .31; and for a group of college freshman (N=65) over a 7-10 month interval were: .60, .84, .83, .74, .70, .76.

Procedure

The settings for this study were the six occupational environments in which the subjects worked. Subjects were approached by the experimenter at their work settings and asked to complete the questionnaires at their convenience. The purpose of the study was explained verbally and again on a cover letter which accompanied the instruments. The questionnaires were grouped in a packet with cover letter. The order of instrumentation was counterbalanced by arranging the packet of materials such that each instrument appeared first on every third packet. This arrangement resulted in nine different orderings of the instruments. All instruments were numbered sequentially by instrument to insure that data for respondents did not get confused.

After one week, the experimenter returned to pick up the completed questionnaires. In many instances two or three retuures were necessary in order to obtain the finished instruments, and, in a few cases, the lapse between issue and returns stretched to as much as two months.
Hypotheses

The following hypotheses were tested:

1. There are significant differences between the mean scores for the six occupational groups (barbers, electronic technicians, photographers, bartenders, gas station managers, accounting technicians) on each scale for the two inventories.

2. There is a significant relationship between the same named scales of the Vocational Preference Inventory (Vocational Scales) and the Self-Directed Search (Occupations and Summary Section scales) for the total occupational group.

Mean scores and standard deviations were computed for all occupational groups on all scales of the Vocational Preference Inventory and the Self-Directed Search. To test the first hypothesis, one-way analyses of variance for unequal N's were performed on each scale of the two inventories using computer program BMD07D described in W. G. Dixon, ed., Biomedical Computer Programs (1970). Thus, a total of seventeen one-way analyses of variance were carried out. Post hoc analysis of significant between group differences were examined by means of the Tukey (b) procedure (Winer, 1971) to identify the location of significance.

To test the second hypothesis, Pearson Product Moment Correlation Coefficients were computed using computer program BMD02D also described in the Biomedical Computer Programs book.

The .05 level of significance was selected to test the hypotheses.
CHAPTER IV

RESULTS

This chapter has been divided into two sections to present the results of the data analysis. The first section is concerned with the tests of the significance of occupational group differentiation on each scale across the two instruments. In the second part of the chapter, the results of the tests of the relationship between the same named scales of the Vocational Preference Inventory and the Self-Directed Search are presented.

Individual Scale Discrimination of Occupational Groups

Results of the analysis of variance of the mean scores for the six occupational groups on each scale of the Vocational Preference Inventory are presented in Table 2. The test for the main effect of groups was found to be significant \((p < .05)\) on five (Artistic, Conventional, Status, Infrequency, and Acquiescence) of the eleven scales. The hypothesis that there are significant differences between occupational group mean scores on these scales was retained. The test for the main effect of groups failed to reach significance \((p > .05)\) for the Realistic, Investigative, Social, Enterprising, Self-control, and Masculinity scales.
TABLE 2
Summary of the Analysis of Variance of the Scores on the Eleven Scales of the Vocational Preference Inventory for the Six Occupational Groups

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>Between Groups MS</th>
<th>Within Groups MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCALE:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realistic</td>
<td>20.7182</td>
<td>11.5732</td>
<td>1.7893</td>
</tr>
<tr>
<td>Investigative</td>
<td>22.9318</td>
<td>14.4974</td>
<td>1.5818</td>
</tr>
<tr>
<td>Artistic</td>
<td>25.9843</td>
<td>10.0464</td>
<td>2.5864b</td>
</tr>
<tr>
<td>Social</td>
<td>15.1296</td>
<td>10.3288</td>
<td>1.4648</td>
</tr>
<tr>
<td>Enterprising</td>
<td>18.1739</td>
<td>13.6884</td>
<td>1.3277</td>
</tr>
<tr>
<td>Conventional</td>
<td>126.9018</td>
<td>12.5001</td>
<td>10.1520a</td>
</tr>
<tr>
<td>Self-Control</td>
<td>22.6147</td>
<td>16.5343</td>
<td>1.3677</td>
</tr>
<tr>
<td>Masculinity</td>
<td>9.6003</td>
<td>4.6904</td>
<td>2.0468</td>
</tr>
<tr>
<td>Status</td>
<td>25.5935</td>
<td>7.7365</td>
<td>3.3082a</td>
</tr>
<tr>
<td>Infrequency</td>
<td>60.6196</td>
<td>9.3500</td>
<td>6.4834a</td>
</tr>
<tr>
<td>Acquiescence</td>
<td>67.4686</td>
<td>27.5565</td>
<td>2.4484b</td>
</tr>
</tbody>
</table>

a = significant .01 level  
b = significant .05 level

Table 3 shows the results of the analysis of variance of the occupational group mean scores on the six scales of the Self-Directed Search. The test for the main effect of groups was found to be significant (p < .01) for all six scales. Thus, the hypothesis that there are significant differences between the occupational group mean scores was retained for the Realistic, Investigative, Artistic, Social,
Enterprising, and Conventional scales.

**TABLE 3**

Summary of the Analysis of Variance of the Scores on the Six Scales of the Self-Directed Search for the Six Occupational Groups

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>Between Groups MS</th>
<th>Within Groups MS</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCALE:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Realistic</td>
<td>132.1077</td>
<td>15.1452</td>
<td>8.7228a</td>
</tr>
<tr>
<td>Investigative</td>
<td>54.1141</td>
<td>11.4518</td>
<td>4.7254a</td>
</tr>
<tr>
<td>Artistic</td>
<td>46.5019</td>
<td>10.9082</td>
<td>4.2630a</td>
</tr>
<tr>
<td>Social</td>
<td>77.3555</td>
<td>8.8834</td>
<td>8.7678a</td>
</tr>
<tr>
<td>Enterprising</td>
<td>59.1417</td>
<td>14.1642</td>
<td>4.1754a</td>
</tr>
</tbody>
</table>

* a = significant .01 level

In order to determine which groups differed from one another, the data were submitted to multiple comparison through the use of the Tukey (b) test. Table 4 summarizes the analysis of all possible combinations of the occupational groups on the five significant scales of the Vocational Preference Inventory.

When all possible combinations of groups were compared on the Artistic scale, photographers were found to be significantly different from gas station managers (*p < .05*) and electronic technicians (*p < .05*). No other differences were found to be significant.
<table>
<thead>
<tr>
<th>SCALE</th>
<th>P &lt; .05</th>
<th>P &lt; .01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artistic</td>
<td>Photographers - Gas Station Managers</td>
<td>No Difference</td>
</tr>
<tr>
<td></td>
<td>Photographers - Electronic Technicians</td>
<td>No Difference</td>
</tr>
<tr>
<td>Conventional</td>
<td>Accounting Clerk - Barber</td>
<td>Accounting Clerk - Barber</td>
</tr>
<tr>
<td></td>
<td>Accounting Clerk - Electronic Technicians</td>
<td>Accounting Clerk - Electronic Technicians</td>
</tr>
<tr>
<td></td>
<td>Accounting Clerk - Photographer</td>
<td>Accounting Clerk - Photographer</td>
</tr>
<tr>
<td></td>
<td>Accounting Clerk - Bartender</td>
<td>Accounting Clerk - Bartender</td>
</tr>
<tr>
<td></td>
<td>Accounting Clerk - Gas Station Managers</td>
<td>Accounting Clerk - Gas Station Managers</td>
</tr>
<tr>
<td>Status</td>
<td>Bartenders - Electronic Technicians</td>
<td>No Difference</td>
</tr>
<tr>
<td>Infrequency</td>
<td>Barbers - Electronic Technicians</td>
<td>Barbers - Electronic Technicians</td>
</tr>
<tr>
<td></td>
<td>Barbers - Photographers</td>
<td>Barbers - Photographers</td>
</tr>
<tr>
<td></td>
<td>Barbers - Gas Station Managers</td>
<td>Barbers - Gas Station Managers</td>
</tr>
<tr>
<td></td>
<td>Barbers - Accounting Clerks</td>
<td>Barbers - Accounting Clerks</td>
</tr>
<tr>
<td>Acquiescence</td>
<td>No Difference</td>
<td>No Difference</td>
</tr>
</tbody>
</table>
Multiple comparison of groups on the Conventional scale showed the accounting clerk group to be significantly different from all other occupational groups, barbers ($p < .01$), bartenders ($p < .01$), electronic technicians ($p < .01$), photographers ($p < .01$), and gas station managers ($p < .01$). However, no other significant findings were revealed.

A comparison of all possible combinations of groups on the Status scale revealed only one significant difference. Bartenders were found to be significantly different ($p < .05$) from electronic technicians.

In analyzing all possible combinations of the occupational groups on the Infrequency scale, barbers were found to be significantly different from electronic technicians ($p < .01$), photographers ($p < .01$), gas station managers ($p < .05$), and accounting clerks ($p < .05$).

The analysis of variance $F$ test was found to be significant for the Acquiescence scale. However, as reflected in Table 4, when multiple comparisons of groups was performed no significant differences were found.

Table 5 contains the means and standard deviations for the six occupational groups' scores on the eleven scales of the Vocational Preference Inventory. Gas station managers had the highest mean score on the Realistic scale, and bartenders scored lowest on this scale. Barbers, the group which Holland's theory would predict to have the highest mean score, had the second highest mean score. On the Investigative scale, photographers scored highest, and barbers scored lowest.
## TABLE 5

Means and Standard Deviations for the Six Occupational Groups on the
Eleven Scales of the Vocational Preference Inventory

<table>
<thead>
<tr>
<th>SCALE</th>
<th>Barbers (N=20)</th>
<th></th>
<th>Electronic Technicians (N=26)</th>
<th></th>
<th>Photographers (N=18)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Realistic</td>
<td>4.750</td>
<td>3.5374</td>
<td>4.577</td>
<td>3.0354</td>
<td>4.222</td>
<td>2.9014</td>
</tr>
<tr>
<td>Investigative</td>
<td>1.900</td>
<td>2.7125</td>
<td>3.923</td>
<td>4.3259</td>
<td>4.556</td>
<td>3.8382</td>
</tr>
<tr>
<td>Artistic</td>
<td>1.950</td>
<td>2.6052</td>
<td>1.731</td>
<td>2.5699</td>
<td>4.667</td>
<td>3.9853</td>
</tr>
<tr>
<td>Social</td>
<td>3.050</td>
<td>3.7201</td>
<td>1.500</td>
<td>3.0496</td>
<td>2.278</td>
<td>3.1400</td>
</tr>
<tr>
<td>Enterprising</td>
<td>3.950</td>
<td>4.2732</td>
<td>2.462</td>
<td>3.3732</td>
<td>4.278</td>
<td>2.8244</td>
</tr>
<tr>
<td>Conventional</td>
<td>2.000</td>
<td>3.1456</td>
<td>1.962</td>
<td>2.8772</td>
<td>2.000</td>
<td>3.4300</td>
</tr>
<tr>
<td>Masculinity</td>
<td>7.900</td>
<td>2.0235</td>
<td>7.885</td>
<td>2.3888</td>
<td>7.778</td>
<td>2.1572</td>
</tr>
<tr>
<td>Status</td>
<td>5.000</td>
<td>2.4279</td>
<td>4.731</td>
<td>2.9470</td>
<td>6.778</td>
<td>3.0011</td>
</tr>
<tr>
<td>Infrequency</td>
<td>9.250</td>
<td>2.7121</td>
<td>4.692</td>
<td>2.9362</td>
<td>4.833</td>
<td>2.3072</td>
</tr>
<tr>
<td>Acquiescence</td>
<td>7.200</td>
<td>4.3842</td>
<td>7.654</td>
<td>5.2455</td>
<td>10.056</td>
<td>3.9775</td>
</tr>
<tr>
<td>SCALE</td>
<td>Bartenders (N=15) M</td>
<td>SD</td>
<td>Gas Station Managers (N=20) M</td>
<td>SD</td>
<td>Accounting Clerks (N=27) M</td>
<td>SD</td>
</tr>
<tr>
<td>--------------</td>
<td>---------------------</td>
<td>-----</td>
<td>-------------------------------</td>
<td>-----</td>
<td>---------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Realistic</td>
<td>2.533</td>
<td>2.9968</td>
<td>5.950</td>
<td>3.7060</td>
<td>4.704</td>
<td>3.8811</td>
</tr>
<tr>
<td>Investigative</td>
<td>2.200</td>
<td>3.0047</td>
<td>3.100</td>
<td>3.8512</td>
<td>4.148</td>
<td>4.2671</td>
</tr>
<tr>
<td>Artistic</td>
<td>2.400</td>
<td>2.9228</td>
<td>1.550</td>
<td>2.9105</td>
<td>2.963</td>
<td>3.7260</td>
</tr>
<tr>
<td>Social</td>
<td>2.933</td>
<td>3.0581</td>
<td>1.550</td>
<td>2.0384</td>
<td>3.407</td>
<td>3.7546</td>
</tr>
<tr>
<td>Enterprising</td>
<td>3.800</td>
<td>3.9897</td>
<td>4.200</td>
<td>2.8946</td>
<td>5.000</td>
<td>4.3589</td>
</tr>
<tr>
<td>Conventional</td>
<td>3.267</td>
<td>2.7377</td>
<td>4.050</td>
<td>4.2112</td>
<td>7.741</td>
<td>4.2207</td>
</tr>
<tr>
<td>Masculinity</td>
<td>8.733</td>
<td>1.8695</td>
<td>9.450</td>
<td>2.1637</td>
<td>8.852</td>
<td>2.1962</td>
</tr>
<tr>
<td>Status</td>
<td>7.533</td>
<td>1.8847</td>
<td>5.400</td>
<td>3.0504</td>
<td>6.704</td>
<td>2.9064</td>
</tr>
<tr>
<td>Infrequency</td>
<td>7.400</td>
<td>3.3551</td>
<td>6.150</td>
<td>3.3604</td>
<td>6.815</td>
<td>3.4198</td>
</tr>
<tr>
<td>Acquiescence</td>
<td>6.600</td>
<td>3.7947</td>
<td>9.700</td>
<td>5.7592</td>
<td>11.037</td>
<td>6.6592</td>
</tr>
</tbody>
</table>
Electronic technicians, who should have scored highest on this scale, had the third highest mean score. Photographers, as expected by the theory, had the highest mean score of all occupational groups on the Artistic scale. On the Social scale, accounting clerks had the highest mean score; the Social group, bartenders had the third highest mean score; and electronic technicians had the lowest mean score. Accounting clerks had the highest mean score on the Enterprising scale, and electronic technicians scored lowest of all groups on this scale. Gas station managers, the Enterprising group, had the third highest mean score on the Enterprising scale. Accounting clerks scored highest on the Conventional scale, and electronic technicians had the lowest score on this scale.

The groups having the highest and lowest mean score on the non-vocational scales by scale were: Self-control - barbers were highest, and electronic technicians were lowest; Masculinity - gas station managers were highest, and photographers were lowest; Status - bartenders were highest, and electronic technicians were lowest; Infrequency - barbers were highest, and electronic technicians were lowest; Acquiescence - accounting clerks were highest, and bartenders were lowest.

The analysis of all possible combinations of the occupational groups on the significant scales of the Self-Directed Search is summarized in Table 6. Comparison of the occupational groups on the Realistic scale showed that bartenders were significant from barbers \( p < .01 \), gas station managers \( p < .01 \), electronic technicians \( p < .01 \), and photographers \( p < .05 \). Accounting clerks were found to be significantly different from gas station managers \( p < .01 \), electronic technicians \( p < .01 \), and barbers \( p < .05 \).
### TABLE 6

**Summary of the Tukey (b) Analysis of All Possible Combinations of Occupational Groups on the Scales of the Self-Directed Search Which Had Significant F Tests**

<table>
<thead>
<tr>
<th>SCALE</th>
<th>P &lt; .05</th>
<th>P &lt; .01</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>Bartenders - Photographers</td>
<td>Bartenders - Barbers</td>
</tr>
<tr>
<td></td>
<td>Bartenders - Barbers</td>
<td>Bartenders - Gas Station Managers</td>
</tr>
<tr>
<td></td>
<td>Bartenders - Gas Station Managers</td>
<td>Bartenders - Electronic Technicians</td>
</tr>
<tr>
<td></td>
<td>Bartenders - Electronic Technicians</td>
<td>Accounting Clerks - Gas Station Managers</td>
</tr>
<tr>
<td></td>
<td>Accounting Clerks - Barbers</td>
<td>Accounting Clerks - Electronic Technicians</td>
</tr>
<tr>
<td></td>
<td>Accounting Clerks - Gas Station Managers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Accounting Clerks - Electronic Technicians</td>
<td></td>
</tr>
<tr>
<td>Investigative</td>
<td>Electronic Technicians - Gas Station Managers</td>
<td>Electronic Technicians - Gas Station Managers</td>
</tr>
<tr>
<td></td>
<td>Electronic Technicians - Barbers</td>
<td>Electronic Technicians - Barbers</td>
</tr>
<tr>
<td>Artistic</td>
<td>Photographers - Gas Station Managers</td>
<td>Photographers - Gas Station Managers</td>
</tr>
<tr>
<td></td>
<td>Photographers - Accounting Clerks</td>
<td>Photographers - Accounting Clerks</td>
</tr>
<tr>
<td></td>
<td>Photographers - Electronic Technicians</td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>Bartenders - Photographers</td>
<td>Bartenders - Photographers</td>
</tr>
<tr>
<td></td>
<td>Bartenders - Electronic Technicians</td>
<td>Bartenders - Electronic Technicians</td>
</tr>
<tr>
<td></td>
<td>Bartenders - Gas Station Managers</td>
<td>Bartenders - Gas Station Managers</td>
</tr>
<tr>
<td></td>
<td>Bartenders - Accounting Clerks</td>
<td>Bartenders - Accounting Clerks</td>
</tr>
<tr>
<td>SCALE</td>
<td>( P &lt; .05 )</td>
<td>( P &lt; .01 )</td>
</tr>
<tr>
<td>---------------------</td>
<td>---------------------------------------------------</td>
<td>---------------------------------------------------</td>
</tr>
<tr>
<td>Social</td>
<td>Barbers - Photographers</td>
<td>Barbers - Photographers</td>
</tr>
<tr>
<td></td>
<td>Barbers - Electronic Technicians</td>
<td>Barbers - Electronic Technicians</td>
</tr>
<tr>
<td></td>
<td>Barbers - Gas Station Managers</td>
<td>Barbers - Gas Station Managers</td>
</tr>
<tr>
<td></td>
<td>Barbers - Accounting Clerks</td>
<td>Barbers - Accounting Clerks</td>
</tr>
<tr>
<td>Enterprising</td>
<td>Bartenders - Accounting Clerks</td>
<td>Bartenders - Accounting Clerks</td>
</tr>
<tr>
<td></td>
<td>Gas Station Managers - Accounting Clerks</td>
<td>Gas Station Managers - Accounting Clerks</td>
</tr>
<tr>
<td>Conventional</td>
<td>Accounting Clerks - Photographers</td>
<td>Accounting Clerks - Photographers</td>
</tr>
<tr>
<td></td>
<td>Accounting Clerks - Barbers</td>
<td>Accounting Clerks - Barbers</td>
</tr>
<tr>
<td></td>
<td>Accounting Clerks - Electronic Technicians</td>
<td>Accounting Clerks - Electronic Technicians</td>
</tr>
<tr>
<td></td>
<td>Accounting Clerks - Gas Station Managers</td>
<td>Accounting Clerks - Gas Station Managers</td>
</tr>
<tr>
<td></td>
<td>Accounting Clerks - Bartenders</td>
<td>Accounting Clerks - Bartenders</td>
</tr>
</tbody>
</table>
On the Investigative scale, electronic technicians were found to be significantly different from gas station managers (p < .01) and barbers (p < .01). No other significant differences between groups were found on this scale.

A comparison of all possible combinations of groups on the Artistic scale showed that the photographers differed significantly from gas station managers (p < .01), accounting clerks (p < .01), and electronic technicians (p < .05).

On the Social scale, bartenders were found to be significantly different from photographers (p < .01), electronic technicians (p < .01), gas station managers (p < .01), and accounting clerks (p < .01). Also, barbers were significantly different from photographers (p < .01), electronic technicians (p < .01), gas station managers (p < .05), and accounting clerks (p < .05).

Multiple comparison of groups on the Enterprising scale revealed that bartenders were significantly different from accounting clerks (p < .01). Also, on this scale, gas station managers were significantly different from accounting clerks (p < .01).

On the Conventional scale, the accounting clerk group was significantly different from all other occupational groups, barbers (p < .01), electronic technicians (p < .01), photographers (p < .01), bartenders (p < .01), and gas station managers (p < .01). No other significant differences were found on the Conventional scale.

Table 7 contains the means and standard deviations for the six occupational groups on the six scales of the Self-Directed Search.
<table>
<thead>
<tr>
<th>SCALE</th>
<th>Barbers (N=20)</th>
<th>Electronic Technicians (N=26)</th>
<th>Photographers (N=18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigative</td>
<td>3.200 2.8023</td>
<td>7.154 3.8125</td>
<td>5.333 3.7259</td>
</tr>
<tr>
<td>Artistic</td>
<td>4.500 3.3325</td>
<td>2.577 3.5459</td>
<td>5.556 3.5846</td>
</tr>
<tr>
<td>Social</td>
<td>9.050 3.1535</td>
<td>5.808 2.7425</td>
<td>5.389 3.3631</td>
</tr>
<tr>
<td>Conventional</td>
<td>3.050 3.0860</td>
<td>3.308 2.8812</td>
<td>2.667 3.1808</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SCALE</th>
<th>Bartenders (N=15)</th>
<th>Gas Station Managers (N=20)</th>
<th>Accounting Clerks (N=27)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investigative</td>
<td>4.533 3.2041</td>
<td>2.950 2.7429</td>
<td>4.963 3.6107</td>
</tr>
<tr>
<td>Artistic</td>
<td>3.667 4.4347</td>
<td>1.800 2.6477</td>
<td>1.889 2.4547</td>
</tr>
<tr>
<td>Social</td>
<td>10.800 1.6987</td>
<td>6.450 3.6052</td>
<td>6.852 2.8380</td>
</tr>
<tr>
<td>Enterprise</td>
<td>9.533 3.6227</td>
<td>9.100 3.3387</td>
<td>5.185 4.4810</td>
</tr>
<tr>
<td>Conventional</td>
<td>5.733 3.4323</td>
<td>5.450 3.2521</td>
<td>11.481 2.9400</td>
</tr>
</tbody>
</table>
On the Realistic scale, the electronic technicians, the Investigative group, had the highest mean score of all occupational groups, and bartenders scored lower than any other group on this scale. The electronic technicians had the highest group mean score on the Investigative scale; gas station managers had the lowest group mean score on this scale. On the Artistic scale, photographers, the Artistic group, had the highest group mean, and gas station managers had the lowest group mean. Bartenders, the Social group, had the highest group mean score on the Social scale, and photographers scored lower on the Social scale than any other occupational group. The group with the highest mean score on the Enterprising scale was bartenders, and accounting clerks scored lowest of any group on this scale. Gas station managers, who should have scored highest on the Enterprising scale, had the second highest group mean score on the Enterprising scale. Accounting clerks clearly had the highest mean score on the Conventional scale, and photographers scored lower on this scale than any other occupational group.

Tables 8 through 13 summarize the rank order of the mean scores of the six occupational groups on each of the six scales across the two instruments. Bartenders, who had the lowest mean score of all groups on the Realistic scales, were the only group to maintain a consistent position on both Realistic scales. However, barbers, photographers, and gas station managers only varied by one rank.
None of the occupational groups held the same relative position on the Investigative scales of the two instruments. There was a rank order difference of one rank for the barbers, photographers, bartenders, and accounting clerks across the two instruments. Electronic technicians and gas station managers had a rank order difference of two ranks on the Investigative scales.

Photographers, bartenders, and gas station managers all held the same relative rank order across the instruments on the Artistic scale. Electronic technicians varied by only one rank. Photographers had the highest mean score and gas station managers the lowest mean scores on both scales.
### TABLE 9

**Rank Order of the Mean Scores for the Investigative Scale Across the Two Instruments**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>VPI</th>
<th>SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbers</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Electronic Technicians</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Photographers</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Bartenders</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Gas Station Managers</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Accounting Clerks</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

### TABLE 10

**Rank Order of the Mean Scores for the Artistic Scale Across the Two Instruments**

<table>
<thead>
<tr>
<th>Occupation</th>
<th>VPI</th>
<th>SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbers</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Electronic Technicians</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Photographers</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Bartenders</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Gas Station Managers</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Accounting Clerks</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>
Barbers maintained a stable position on the Social scales of the instruments. Bartenders and accounting clerks were rank ordered in inverse order with bartenders having the first and third highest mean scores and accounting clerks having the third and first highest mean scores across the inventories, respectively. Two groups, electronic technicians and gas station managers, varied by one rank.

<table>
<thead>
<tr>
<th>TABLE II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank Order of the Mean Scores for the Social Scale Across the Two Instruments.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>VPI</th>
<th>SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbers</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Electronic Technicians</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Photographers</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Bartenders</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Gas Station Managers</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Accounting Clerks</td>
<td>1</td>
<td>3</td>
</tr>
</tbody>
</table>

The occupational groups were rank ordered more disparately across the two measures on the Enterprising scale than on any other scale. Accounting clerks had the highest mean score of all groups on the Enterprising scale of the Vocational Preference Inventory, and the lowest mean score of all groups on the Enterprising scale of the Self-Directed Search. No occupational group held the same relative rank order on this scale across the two instruments. However, three groups, barbers,
electronic technicians, and gas station managers, varied by only one rank.

### TABLE 12

<table>
<thead>
<tr>
<th>Occupation</th>
<th>VPI</th>
<th>SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbers</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Electronic Technicians</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Photographers</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Bartenders</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Gas Station Managers</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Accounting Clerks</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>

Accounting clerks, the Conventional group, had the highest mean score of all groups on the Conventional scales of both inventories. No other group maintained the same relative rank order across the instruments, but four groups, barbers, photographers, bartenders, and gas station managers, varied by only one rank.

Table 14 contains a summary of the occupational groups having the highest mean scores on the same named scales of the two instruments. The findings tentatively suggest that, with the exception of the Artistic and Conventional scales, the two inventories (using this sample of workers) seem to distribute the occupational groups differently.
TABLE 13

Rank Order of the Mean Scores for the Conventional Scale Across the Two Instruments

<table>
<thead>
<tr>
<th>Occupations</th>
<th>VPI</th>
<th>SDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barbers</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Electronic Technicians</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>Photographers</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Bartenders</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Gas Station Managers</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Accounting Clerks</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

TABLE 14

Summary of the Highest Mean Score for Each Occupational Group Across the Two Instruments

<table>
<thead>
<tr>
<th>Dominance Style</th>
<th>Occupational Group</th>
<th>Occupational Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>Gas Station Managers</td>
<td>Electronic Technicians</td>
</tr>
<tr>
<td>(Barber)</td>
<td>Investigative</td>
<td>Photographers</td>
</tr>
<tr>
<td></td>
<td>(Electronic Technician)</td>
<td>Electronic Technicians</td>
</tr>
<tr>
<td>Artistic</td>
<td></td>
<td>Photographers</td>
</tr>
<tr>
<td>(Photographer)</td>
<td></td>
<td>Photographers</td>
</tr>
<tr>
<td>Social</td>
<td>Accounting Clerks</td>
<td>Bartenders</td>
</tr>
<tr>
<td>(Bartender)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enterprising</td>
<td>Accounting Clerks</td>
<td>Bartenders</td>
</tr>
<tr>
<td>(Gas Station Manager)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conventional</td>
<td>Accounting Clerks</td>
<td>Accounting Clerks</td>
</tr>
<tr>
<td>(Accounting Clerk)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Scores for the total occupational group on the vocational scales of the Vocational Preference Inventory and the summary scales of the Self-Directed Search were intercorrelated in order to test the second hypothesis. The resulting matrix of correlations is shown in Table 15 with the correlations of the same named scales appearing on the diagonal. The correlations for these six same named scales ranged from a high of .60 between the Conventional scales to a low of .25 between the Realistic scales. All six of the correlation coefficients were significant ($p < .01$). The findings tend to support the second hypothesis.

Scores for the total occupational group on the vocational scales of the Vocational Preference Inventory were intercorrelated with the six scales from the occupations section of the Self-Directed Search. Table 16 shows the resulting matrix of correlations with the same named scales appearing on the diagonal. The correlations of these six same named scales ranged from a high of .90 between the Investigative scales to a low of .73 between the Social scales. All six of the correlation coefficients were significant ($p < .01$). The findings, again, tend to support the second hypothesis.
TABLE 15
Correlations of Same Name Scales of the Vocational Preference Inventory
Vocational Scales and the Self-Directed Search Summary Scales

<table>
<thead>
<tr>
<th></th>
<th>Realistic</th>
<th>Investigative</th>
<th>Artistic</th>
<th>Social</th>
<th>Enterprising</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.2527&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Investigative</td>
<td>.0228</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>.4875&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Artistic</td>
<td>-.2911</td>
<td>-.0541</td>
<td></td>
<td></td>
<td></td>
<td>.4046&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Social</td>
<td>.2063</td>
<td>-.2573</td>
<td>-.0678</td>
<td></td>
<td></td>
<td>.3160&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Enterprising</td>
<td>.0435</td>
<td>-.1327</td>
<td>-.0441</td>
<td>.2945</td>
<td>.5657&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Conventional</td>
<td>.0569</td>
<td>.0768</td>
<td>-.0372</td>
<td>.1123</td>
<td>.1609</td>
<td>.5962&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> = significant at .01 level
TABLE 16
Correlations of Same Named Scales of the Vocational Preference Inventory
Vocational Scale and the Occupation Scales of the Self-Directed Search

<table>
<thead>
<tr>
<th></th>
<th>Realistic</th>
<th>Investigative</th>
<th>Artistic</th>
<th>Social</th>
<th>Enterprising</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>.7927&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investigative</td>
<td>.3567</td>
<td>.8966&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Artistic</td>
<td>.0582</td>
<td>.3862</td>
<td>.7741&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>.2353</td>
<td>.3185</td>
<td>.2473</td>
<td>.7333&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enterprising</td>
<td>.3149</td>
<td>.2755</td>
<td>.2740</td>
<td>.5243</td>
<td>.7928&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Conventional</td>
<td>.3890</td>
<td>.3814</td>
<td>.1370</td>
<td>.3547</td>
<td>.4258</td>
<td>.8191&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>
Summary

Two vocational scales, Artistic and Conventional, and three non-vocational scales, Status, Infrequency, and Acquiescence, of the Vocational Preference Inventory, and all scales of the Self-Directed Search (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional) significantly differentiated the six occupational groups. Thus, the first hypothesis was accepted for these scales.

All vocational scales of the Vocational Preference Inventory were significantly correlated with the same named summary scales and occupational scales of the Self-Directed Search. The findings tend to support the second hypothesis.
CHAPTER V

DISCUSSION

This study was primarily designed to investigate the concurrent validity of the Vocational Preference Inventory and the Self-Directed Search, two instruments designed by Holland to operationalize his theory. A major premise of Holland's theory is that persons seek and enter occupational environments congruent with their personal orientation. Six occupations were selected as representative of each Holland classification, and samples of non-college degree workers currently established in the occupational environments responded to the Vocational Preference Inventory and the Self-Directed Search. A secondary purpose for this study was to investigate the relationship between the same named scales of the two instruments. Since each instrument has been designed to measure an individual's personal orientation, it was expected that the relationship between the same named scales of the two inventories would be positive and high.

Results of the analysis of variance and Tukey (b) test were reported in Chapter IV. On the VPI, five scales (Artistic, Conventional, Status, Infrequency, and Acquiescence) were found to be significant \( (p < .05 \) or greater) in the test for the main effect of groups. It was expected that each occupational group would be differentiated from all other occupational groups on the scale corresponding to its environmental type. From the first analysis, it is obvious that this did not
occur for barbers, electronic technicians, bartenders, and gas station managers. A follow-up analysis using the Tukey (b) test showed that for the two significant vocational scales (Artistic and Conventional), the appropriate groups, photographers and accounting clerks, were differentiated from other occupational groups in accordance with Holland's theory.

The remaining significant scales were non-vocational scales. The Status scale measures the individual's desire for power and prestige, and, to some extent, gives a measure of self-esteem. Using Holland's descriptions of the personal orientations, one would expect Enterprising and Social persons to score high on this scale, and Investigative and Artistic persons to score low. Consistent with Holland's theory, bartenders (Social group) were differentiated from electronic technicians (Investigative group).

The Infrequency scale measures a variety of traits which correlate to provide an indication of the individual's perception of his competency. High scores on this scale are associated with feelings of incompetence while low scores indicate feelings of personal effectiveness. Holland's description of the Realistic person includes his tendency to rate himself low in self-confidence. The Investigative individual, on the other hand, generally identifies with achievement. Barbers were differentiated on this scale from all groups except bartenders. Electronic technicians had the lowest mean score of any group on this scale. These two groups (barbers and electronic technicians) represent the Realistic and Investigative orientations, respectively.

Thus, it appears that the Infrequency scale separates the groups in
accordance with expected characteristics associated with these groups.

The Acquiescence scale is included in the VPI primarily to detect response bias. Persons who score high, but not to high, on this scale generally chose many occupations and have an optimistic outlook on the vocational world; low scorers are associated with self-deprecation. From Holland's descriptions of the personal orientations, one would expect the Social person to score somewhat high on this scale, and the Realistic and Conventional types to be at the lower end of the scale. The location of significant differences between groups on the Acquiescence scale was not identified with multiple comparison of groups. The scale's distribution of occupational group mean scores would lead one to conclude that Holland's model is not confirmed for this scale. Bartenders had the lowest mean score of all occupational groups on this scale, and accounting clerks the highest.

Although four vocational scales, Realistic, Investigative, Social, and Enterprising, did not significantly differentiate the occupational groups, some indication of their effectiveness may be gleaned by examining the rank order of the mean scores on these scales. According to the hexagonal model (Holland, et al., 1969) reproduced in Chapter II, certain groups should cluster at the high end of the scales while others should cluster at the low end. For example, on the Realistic scale barbers, electronic technicians, and accounting clerks should score higher than photographers, gas station managers, and bartenders, whose scores should cluster at the lower end of the scale (See Tables 8 - 13 in Chapter IV for the rank order of occupational groups on the VPI scales). The rank order of groups on the Realistic scale
reveals only one inversion, that being for gas station managers. Otherwise bartenders are at the lower end of the scale along with photographers, while barbers, accounting clerks, and electronic technicians are clustered at the top. This arrangement of the occupational groups on the Realistic scale tends to support Holland's model.

Similar comparisons for the Investigative scale do not support the model. In this case, electronic technicians and gas station managers are in the center of the groups when they should be at the high and low end, respectively. Rather than clustering next to one another, photographers and accounting clerks should be separated by bartenders and gas station managers or at least by one of the latter. The same condition holds for bartenders and barbers.

On the Social scale, accounting clerks and barbers should be at the lower end of the scale, but are found to be the highest two groups. The disparity in the differentiation of the groups on this scale tends not to support the model.

Finally, the Enterprising scale also shows some marked discrepancies from the model. Conventional and Artistic types and Realistic and Social types are polar opposites on the hexagon. However, the groups associated with these types (accounting clerks and photographers, and barbers and bartenders, respectively) had means rank ordering them next to each other on the Enterprising scale. Instead of being at the top of the scale, the Enterprising group (gas station managers) mean is in the middle of the occupational groups' means. However, the Investigative group (electronic technicians) mean is at the lower end of the scale as it should be. Once again the evidence tends to disconfirm
the model.

On the SDS, the test for the main effect of groups was found to be significant ($p < .01$) for all six scales. The Tukey (b) analysis was completed on all scales to locate the significant differences.

Bartenders and accounting clerks were effectively differentiated from other occupational groups on the Realistic scale. Bartenders had the lowest mean score on this scale which is consistent with Holland's theory. The occupational group expected to be differentiated from other groups by this scale was the barber group. However, barbers were found toward the middle of the scale instead of the top. The arrangement of groups on this scale makes interpretation somewhat difficult, and warrants withholding judgement on support or lack thereof for the model.

On the Investigative scale, the electronic technician group was appropriately differentiated from gas station managers and barbers. According to the hexagonal model, electronic technicians and gas station managers are polar opposites, and the group means of these groups were at the upper and lower end of the scale, respectively. The results for this scale clearly evidence support for the model.

The distribution of groups on the Artistic scale generally conforms to expectation from Holland's model. Photographers were effectively differentiated from gas station managers, accounting clerks, and electronic technicians.

The appropriate group, bartenders, had the highest mean score, and was differentiated from the other occupational groups on the Social scale. However, barbers, who should have had the lowest mean score on this scale, had the second highest mean score, and were well
differentiated from other occupational groups. With the exception of
the inversion of the barber group, the distribution of occupations on
the Social scale is consistent with and supports the Holland model.

Both bartenders and gas station managers had high group mean
scores on the Enterprising scale. Contrary to expectations from the
Holland model, the Conventional group (accounting clerks) scored lowest
on this scale. Generally, the Enterprising scale appears to differen-
tiate the groups in a manner consistent with Holland's theory.

As was the case with the VPI, the Conventional scale most clearly
differentiated the occupational groups in accord with Holland's model.
The accounting clerks scored highest on this scale, and were differen-
tiated from all other occupational groups. Photographers, the polar
opposite of the Conventional group, were at the bottom of the scale.

In summary, with the exception of the Realistic scale, the five
remaining scales of the Self-Directed Search differentiated the occupa-
tional groups generally in accordance with Holland's theory. The
results for the Vocational Preference Inventory were mixed. Two of the
vocational scales, Artistic and Conventional, significantly differen-
tiated the occupational groups; the Realistic scale appeared to distri-
bute the groups in accordance with Holland's theory, although this
differentiation was not significant; and, three scales, Investigative,
Social, and Enterprising, tended not to support the model.

Not only is the concurrent validity of the Self-Directed Search
substantiated by this data, but, also, the assumption that persons tend
to enter occupational environments which are congruent with their
personality orientation is supported. Results of the data analysis for
the Vocational Preference Inventory showed mixed support for its concurrent validity. The findings tentatively suggest that the Self-Directed Search may be a more effective instrument for use with this group of non-college degreed persons.

As will be recalled from the discussion in Chapter III, the Self-Directed Search is made up of five domains, activity, competency, occupational, and self-ratings (two parts each of which is a separate domain). The occupational domain of the SDS contains the same items as the vocational scales (from which the personality orientation is derived) of the VPI. Thus, the addition of the activity, competency, and self-rating domains, components of the Self-Directed Search, to the occupation domain, primary component of the Vocational Preference Inventory, appears to increase the discriminatory power with which personality types can be classified. The extent each domain contributes to the accuracy of classification can not be determined from this analysis.

The correlational analysis between the same named scales of the Vocational Preference Inventory vocational scales and Self-Directed Search Summary and Occupations section scales showed the two instruments to be significantly \((p < .01)\) related. The correlation coefficients for the vocational scales of the VPI and the same named summary scales of the SDS were found to be moderately high. The correlation coefficients for the vocational scales of the VPI and the same named occupational scales of the SDS were found to be very high.

The items comprising the vocational scales of the VPI and the scales of the occupations section of the SDS are identical and a very high correlation should exist between these two sets of scales. In a
sense these data provide a retest reliability coefficient for these scales. The time between first and second testing varied considerably, from just a few minutes to several weeks. However, the correlations obtained here compare favorably to the retest reliability coefficients reported by Holland (1965) in the manual for the VPI. The significant nature of these intercorrelations also suggests that respondents were completing the instruments in a consistent, conscientious fashion.
CHAPTER VI

SUMMARY, CONCLUSIONS AND IMPLICATIONS

Summary

This study was designed to test the concurrent validity of two instruments operationalizing Holland's theory of vocational choice. The two instruments (the Vocational Preference Inventory and the Self-Directed Search) were administered to samples of non-college degreed workers established in occupational milieus that correspond to Holland's six vocational environments. Previous research has demonstrated the validity of Holland's theory for a highly talented segment of the working world. Holland's theoretical statements concerning the nature of occupational selection provides a framework for evaluating vocational choice and suggests that Holland's six personality models might conceivably exist in the working world for a representative and differentiated sample of workers. A secondary purpose of this study was to examine the relationship between same named scales of the two inventories. Since each instrument has been designed to measure an individual's personal orientation, it was expected that the relationship between same named scales of the two inventories would be positive and high.

Six occupations, barber, electronic technician, photographer, bartender, gas station manager, and accounting clerk, were selected as representative of Holland's six vocational environments. One hundred and twenty-six subjects with a minimum of one year's experience in the
selected occupations and no more than two years college education were drawn from the occupational environments. Each subject responded to the Vocational Preference Inventory, the Self-Directed Search and a biographical questionnaire (See Appendix A).

One way analysis of variance for unequal N's was used to test for a significant difference between the groups on each scale of the two instruments. A total of seventeen one way analyses of variance were carried out. Post hoc analysis of significant between group differences were examined by means of the Tukey (b) procedure to identify the location of significance. The relationship between same named scales of the two inventories was tested by means of the Pearson Product Moment Correlation Coefficient.

Major Findings and Conclusions

Findings from the analyses of variance for the eleven scales of the Vocational Preference Inventory and the six scales of the Self-Directed Search, and the subsequent analyses of all possible combinations of occupational group means on each scale were:

1. The occupational groups were significantly differentiated (p < .05 or greater) on the Artistic and Conventional vocational scales and on the Status, Infrequency, and Acquiescence non-vocational scales of the Vocational Preference Inventory;

2. The occupational groups were not significantly differentiated (p > .05) on the Realistic, Investigative, Social or Enterprising vocational scales nor on the Self-control
or Masculinity scales of the Vocational Preference Inventory;

3. The appropriate occupational groups were significantly differentiated \((p < .05 \text{ or greater})\) on the Artistic and Conventional vocational scales and on the Status and Infrequency non-vocational scales of the Vocational Preference Inventory;

4. The occupational groups were significantly differentiated \((p < .01)\) on each of the six scales (Realistic, Investigative, Artistic, Social, Conventional, and Enterprising) of the Self-Directed Search;

5. The appropriate occupational groups were significantly differentiated \((p < .05 \text{ or greater})\) on the Investigative, Artistic, Social, Enterprising, and Conventional scales, but not on the Realistic scale of the Self-Directed Search.

Findings 1, 2, and 3 indicate that five scales of the VPI discriminate the occupational groups of this sample more effectively than the others. This finding tentatively suggests that the concurrent validity of the VPI may vary from scale to scale depending upon the sample of occupations being used. Findings 5 and 6 indicate strong support for the concurrent validity of the Self-Directed Search.

Findings resulting from the ancilliary study investigating the relationship between the same named scales of the two instruments were

1. There is a significant \((p < .01)\) relationship between the vocational scales of the Vocational Preference Inventory and the composite scales of the Self-Directed Search;

2. There is a significant \((p < .01)\) relationship between the
occupational scales of the Vocational Preference Inventory
and the scales of the occupations section of the Self-
Directed Search.

Findings 1 and 2 suggest that the same named scales of the two
inventories are measuring the similar personality orientation.

Limitations

Any conclusion which may be drawn from this study must be viewed
with an eye toward the studies limitations. Three limitations can be
identified.

First, the sample is small, and representative only of the occupa-
ations from which they came. Thus, generalizations to the larger popu-
lation of the chosen occupations should be made with caution and
generalizations to other occupational groups at the sub-professional
level should be guarded.

Second, the sample was limited to male non-college degreed
workers. Thus, inferences about the theory with respect to female non-
college workers is limited.

Finally, the study was designed as a cross sectional study.
Therefore, inferences with regard to the development of the personal
orientations can not be made. A longitudinal study or cross sectional
studies with different age groups would be desirable to help bring the
theory for non-college degreed persons to the same point that it is for
the highly talented samples which Holland has studied.
Implications

The most significant implication of this study for career development research is that it indicates the relevance of Holland's theory of vocational choice for male non-college degreed workers. The theoretical assumption that persons seek occupational environments which are congruent with their personal orientation appears to be supported from the evidence that the Self-Directed Search scales identified and differentiated the appropriate occupational groups. An implication of this finding would be that the psychological difference between occupational environments at this level must be of sufficient magnitude to differentially attract the six personality types. Further study is needed to determine if the psychological distance between occupational environments diminishes as one moves from the professional to the unskilled levels of the occupational classifications as suggested by Roe and Klos (1969).

Another implication is found in the fact that five of the six Self-Directed Search scales significantly differentiated the appropriate occupational group but only two of the six vocational scales of the Vocational Preference Inventory significantly differentiated the appropriate occupational group. The significant relationship between the same named summary scales of the Self-Directed Search and vocational scales of the Vocational Preference Inventory indicates that the same named scales are measuring the similar personality type. The implication here is that the Self-Directed Search is a more discriminating measure of the personality orientations for this sample of workers. Therefore, the addition of the activity, competency and
self-rating domains to the occupational domain appears to increase the discriminatory power with which personality types can be classified. The extent each domain contributes to the accuracy of classification can not be determined from this analysis. Further study should be conducted in this area.
Dear Sir:

Before going any further, I would like to thank you for your participation in this research endeavor. As you may know, today there are numerous persons involved in the task of helping others obtain employment in occupations which will be rewarding and satisfactory. To do this school guidance counselors and employment agencies frequently use survey instruments which identify characteristics, likes and dislikes, and specific preferences of the person seeking employment. The person seeking employment may then be compared to employed groups in specific occupations and encouraged to look into those occupations where his characteristics, likes and dislikes, and preferences are most like characteristics, likes and dislikes and preferences of the occupational groups.

Thus, your participation in this research endeavor will help determine if these instruments should be used with persons seeking employment in your occupational field. Your cooperation in completing the attached instruments is most appreciated. I will be available to discuss with you the results of the testing which you have completed.

Sincerely yours,

Francis J. Fishburne
1. Please give the title of your present job (be specific):

2. Length, in years, of employment in present job: __________

3. Age: __________

4. Last school grade completed (Place an X on appropriate line):
   - 1 - 6
   - 7 - 9
   - 10 - 12
   - Some college but less than 1 year
   - 1 - 2 years of college
   - 3 - 4 years of college

   If you attended college, please give the name of the college:

5. Total length of employment in present occupation (if you have changed jobs but all jobs have been the same but for different employers, count that as the total time). (Place an X on the appropriate line):
   - Less than one year
   - One year
   - Two years
   - Three years
   - Four years
   - Five years
   - Six to ten years
   - More than ten years

6. Employment, for a period of six months or more, in an occupation(s) other than your present occupation (Place an X on the appropriate line):
   - I have never been employed in an occupation other than the one in which I am now employed.
   - One other occupation
   - Two other occupations
   - Three other occupations
   - More than three other occupations

   If you have been employed in another occupation, please list the last occupation you were employed in prior to the occupation you are presently in, give specific job title:

Please turn this page over and complete the questions on other side.
7. How did you select your current occupation (Place an X on the appropriate line):
   - I had planned on going into this occupation when I was still in school.
   - It was by chance that I am in this occupation.
   - I considered other occupations before selecting the one I am in now.
   - Other, please describe ____________________________

8. At the present time (Choose one):
   - I am thinking about entering another occupation.
   - I do not know if I will stay in this occupation but plan to give it a few more years before making a decision to change.
   - I expect to stay in this occupation unless something better comes up.
   - I will remain in this occupation until I retire.
BIBLIOGRAPHY
BIBLIOGRAPHY


Holland, J. L.: Explorations of a theory of vocational choice and achievement: II. A four-year prediction study. *Psychological Reports*, 1963, 12, 547-594. (a)


Holland, J. L.: The psychology of vocational choice: A theory of Personality types and Model environments. Waltham, Massachusetts: Blaisdell, 1966. (a)


