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AN EXAMINATION OF THE ROLE OF SEX AND RACE ON OCCUPATIONAL STEREOTYPING USING HOLLAND'S THEORY

The Ohio State University

Ph.D. 1985

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An Examination of the Role of Sex and Race on Occupational Stereotyping Using Holland's Theory

DISSERTATION

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

By

Shelia Jeanette Parker, B.A., M.A.

* * * *

The Ohio State University

1985

Reading Committee:

Fred Damarin
Henry Leland
W. Bruce Walsh
Dayle Blyth

Approved By

Fred Damarin
Adviser
Department of Psychology
ACKNOWLEDGEMENTS

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VITA

April 4, 1957 .............Born - Spotsylvania, Virginia

1979 ......................B.S., Norfolk State University, Norfolk, Virginia

1980 (Summer) ............Behavioral Science Intern, Army Research Institute Alexandria, Virginia

1980 - 1983 ...............Teaching Assistant, Department of Psychology, The Ohio State University

1983 (Summer) .............Tutor, Nigerian Education Program, College Of Education, The Ohio State University

1983 ......................M.A., The Ohio State University, Columbus, Ohio

1983 - 1984 ...............Teaching Assistant, Department of Psychology, The Ohio State University

1984 - 1985 ...............Research Associate, Nigerian Education Program, College of Education The Ohio State University
FIELDS OF STUDY

Major Field: Developmental Psychology

Studies in Developmental Child-Clinical.
Professors Feliscima Serafica and Charles Wenar.

Studies in Developmental Differential.
Professor Fred Damarin


Studies in Developmental Mental Retardation.
Professor Henry Leland.


Studies in Education Foundations and Research.
Professor John Kennedy.

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CHAPTER I

INTRODUCTION

Most social scientists will agree that people have stereotypes of occupational group members and that these stereotypes have some degree of validity. Holland (1977) states that without the existence of vocational stereotypes, our interest inventories would have less validity than they do. This assumption, about vocational stereotypes, underlies Holland's theory of vocational choice and three widely used instruments in the field of vocational counseling. Two of these, the Self-Directed Search (SDS; Holland, 1977) and the Vocational Preference Inventory (VPI; Holland, 1973) were developed by Holland to operationalize his vocational theory. The third instrument, the Strong-Campbell Interest Inventory (SCII; Campbell, 1977) was revised using Holland's theoretical representations.

Definition and Origin

The term, stereotype, is derived from the Greek word stereos, meaning solid, and typos, meaning the mark of a blow, impression, or model. The term was first used in 1798 by the French printer, Didot, to describe a printing process involving the use of fixed casts of the material to be reproduced. Approximately a century later, psychiatrists
began to use the term stereotypy to denote a pathological condition characterized by behavior of "persistent repetitiveness and an unchanging mode of expression" (Gordon, 1962, p. 4). A dictionary of psychological terms has defined "stereotype" as:

A relatively rigid and oversimplified or biased perception or conception of an aspect of reality, especially of persons or social groups, e.g., the perception of "bankers" - in general and without discrimination - as unvariably cold-hearted in business dealings (English & English, 1959, p. 523).

In 1922, Lippman brought the term stereotype to the attention of social psychologists (Brigham, 1971; Jones, 1977). In his book, Public Opinion, Lippmann (1922) presented stereotypes as "the pictures in our head," which make up a repertory of fixed impressions of the environment or a part of it. A close examination of the term, stereotype, as defined by Lippmann (1922) and English & English (1959) reflect inaccurate, rigidly-held and faulty observational processes.

Lippmann's basic thesis was that "humans do not respond directly to external reality but to a representation of the environment which is in less or greater degree made by man himself (p. 10). He called this a "pseudoenvironment" or "fiction". Lippmann assumed that "reality" was too complex to be fully represented in the individual's "pseudoenvironment" or "fiction". He argued that stereotypes serve to simplify perception and cognition. In this sense, Lippmann was advocating a cognitive view of behavior, specifying a link between thought and action.
Lippmann's use of the term, stereotype, was much like the cognitive psychologists' use of the term "schema". For Lippmann, stereotypes were cognitive structures that help individuals process information about the environment: "this is the perfect stereotype. Its hallmark is that it precedes the use of reason; is a form of perception, imposes a certain character on the intelligence" (Lippmann, 1922, p. 65). Similar types of definitions can be found for the term "schema" (Baldwin, 1967; Drever, 1976; and Gardner, 1978). Baldwin (1967) states that a schema is nothing more than a reliable response to a stimulus. It includes simple, predictable responses practically at the reflex level (before the data reach the intelligence). Drever (1976) in a dictionary of psychological terms has defined "schema" as:

a mental framework or outline, which refuses to be sharply defined consciously, is of the order of a set or attitude, but less definite, and functions as a kind of vague standard, arising out of past experience, and placing any fresh experience into its appropriate context and relations.

Gardner (1978) further contends that schemas are those sets of features which hold constant across different situations (or realization). These commonalities in the definitions of stereotypes and schema lay the foundations for an interchange of terms. This interchange will help to alleviate certain negative connotations associated with the term stereotype.

Ashmore & Del Boca (1981) state that stereotypes should not be assumed to be all negative for three reasons. It is not parsimonious to add this value judgment to the substantive specification of what a
stereotype is. More importantly, defining stereotypes as negative leads to the inference that stereotyping refers to cognitive structures and processes that are deviant, bizarre or pathological. The third argument is closely related to the second. The stereotypes-as-negative notion has not only cut off stereotypes research from possibly relevant "basic" research and theory, it has also lead researchers to assume rather than study the alleged reasons for badness.

It is also important to note that Lippmann did not conceive stereotypes solely in cognitive terms, but he contended that stereotypes are emotionally charged. He states that:

A pattern of stereotypes is not neutral. It is not merely a way of substituting order for the great, blooming, buzzing confusion of reality. It is all these things and something more. It is a guarantee of our self-respect; it is the projection upon the world of our own sense, of our own value, our own position and our own rights. The stereotypes are ... highly charged with the feelings that are attached to them (p. 96).

Elmendorf (1972) supports this statement, when she states that "stereotypes usually have a strong affective element, they are loaded with affection, dislike, fears, wishes or pride. They lead to automatic judging in keeping with these feelings" (p. 12).

While Holland does not define stereotype explicitly, his definition can be derived from the context in which he uses the term. He states that "vocational stereotypes have reliable and important psychological and sociological meanings." In the specific concrete form given it by Holland: (a) people have stereotypes for a given occupation,
and (b) those stereotypes have a degree of accuracy, i.e., the stereotypes accurately reflect psychological characteristics possessed by a person in the occupation. His confidence that vocational stereotypes are reliable across people and over time rests on the demonstrated validity of the Strong and the Kuder in longitudinal studies.

This study will investigate the truth of Holland's assumption. Elmendorf (1972) contends that if an assumption underlying a theory is demonstrated questionable or false, there are implications for the truth of the theory itself. The same argument can be applied to the construct validity of psychological measuring instruments. Elmendorf further contends that if support is found for the assumption, then the theory itself is strengthened, and in the case of the instruments, increased faith can be put in the meaning attributed to the profiles of tested subjects.

However, beyond the theory and the instrument, studies of this nature are of practical importance to counselors working with clients in the area of vocational exploration and choice. In a society where the number of occupations are estimated well over 25,000, youth have very little opportunity to observe or experience most occupations first-hand. So therefore, there is a need for counselors to be sensitive to the accuracy of their client's notions about specific occupations and occupational group members. If a client has an accurate picture of some occupations, the counselor's work may be expedited. To the extent that clients have inaccurate stereotypes (partial or whole) of some
occupations, they may reject occupations that they could enjoy. It would also prove valuable to counselors to know if there are race and sex differences in accuracy of stereotypes. This study will help to emphasize the importance of such awareness.

Since this study grew out of reflections on Holland's theory, his concepts and the assumptions underlying his theory, it will employ one of the instruments developed by Holland (The Self-Directed Search), both Holland's theory and his assumptions will be reviewed next.

Overview of Holland's Theory

The theory of vocational behavior developed by Holland (1962) suggests that an expression of vocational choice is an expression of personality. Holland's theoretical formulations appear to stem from Lewin's (1935) postulation that behavior is a function of the interaction of the person and the environment, B=f(P,E). Essentially this interaction involves the predisposition of each person toward specific activities, interests, competencies, and the cultural, social, economic, personal and environmental forces that surround him. As a result of experiencing these various forces, each individual then develops a preferred method of dealing with his or her own environment.

Holland's theory is built on the following assumptions:

1. Most people can be categorized as one of six personality types labeled: realistic, investigative, artistic, social, enterprising, or conventional.
2. There are six kinds of environments: realistic, investigative, artistic, social, enterprising and conventional.

3. People search for environments that will let them exercise their skills and abilities, express their attitudes and values, and take on agreeable problems and roles.

4. A person's behavior is determined by an interaction between his or her personality and the characteristics of the environment.

5. The degree of congruence between a person and an occupation (environment) can be estimated by a "hexagonal model."

6. The degree of consistency within a person or an environment is also defined by using the hexagonal model.

7. The degree of differentiation of a person or an environment modifies predictions made from a person's SDS profile, from an occupational code, or from their interaction.

Holland conceptualizes six personality orientations and six environmental orientations. Within either the domain of the environment or the personality for a particular type, Holland depicts the characteristics of each in similar psychological terms:

The Realistic individual is masculine, physically strong, unsociable, aggressive, good motor coordination and skills, lacks verbal and interpersonal skills, prefers concrete as opposed to abstract problems, sees himself as aggressive, has conventional political and economic goals, and rarely performs creatively in the arts and sciences. Such men prefer occupations such as mechanic, electrician, crane operator and tool designer (Campbell & Holland, 1972).
The realistic environment would have the corresponding characteristics:

This environment is explicit, physical and concrete in nature. Effective solutions often require mechanical ingenuity and skills, 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 physical activities that frequently require only stereotyped communication. Tasks frequently call for simple sets of action. The visibility of the environmental demands make success and failure almost immediately obvious (Holland, 1966).

The remaining personality and environmental types are as follows:

Investigative: This category includes those who are task-oriented, introspective and unsocial; prefer to think rather than act out problems; have greater curiosity about the 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 (Campbell & Holland, 1972).

This environment is characterized by the dominance of environmental demands. It entails the observation and symbolic, systematic, creative investigation of physical, biological, or cultural phenomena. It encourages scientific competencies and achievements. It demands mathematical and scientific ability. It encourages people to see the world in complex, abstract, independent and original ways (Holland,
Artistic: The Artistic model avoids problems that are highly structured or require gross physical skills; resembles the Investigative type in being intraceptive and unsocial but differs in having a greater need for individual expression, and 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, drama coach, and symphony conductor (Campbell & Holland, 1972).

The environment is characterized by ambiguity, freedom, unsystematized activities. It encourages people to see themselves as expressive, original, intuitive, feminine, nonconforming, independent, and as having artistic abilities (e.g., acting, writing, speaking). It encourages people to see the world in complex, independent, unconventional and flexible ways (Holland, 1966).

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 manipulation of others. Vocational preferences include clinical psychologist, missionary, high school teacher, marriage counselor, and speech therapist (Campbell & Holland, 1972).

The environment entails the manipulation of others to inform, train, develop, cure or enlighten. It fosters social competencies. It encourages people to see themselves as liking to help others, as
understanding of others, cooperative, and sociable; it encourages them to see the world in flexible ways. It rewards people for the display of social values (Holland, 1966, p. 31).

**Enterprising:** This type of person 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 efforts, differs from the Conventional type in that he prefers concern for power, status and leadership, is orally aggressive. Chooses occupations such as business executive, political campaign manager, and television producer (Campbell & Holland, 1972).

The environment entails the manipulation of others to attain organizational or self-interest goals. It places emphasis on achievements. It encourages people to see themselves as aggressive, popular, self-confident, sociable, and as possessing leadership ability and speaking ability. It encourages people to see the world in terms of power, status, responsibility, and in stereotyped, constricted, dependent, and simple terms (Holland, 1966, p. 32).

**Conventional:** Conventional men prefer structured verbal and numerical activities; are conforming, prefer subordinate roles; are effective at well structured tasks, but avoids ambiguous situations and problems involving interpersonal relationships and physical skills; identify with power; preferences include bank examiner, bookkeeper, financial analyst, quality control expert, statistician, and traffic manager (Campbell & Holland, 1972).
The environment entails the explicit, ordered, systematic manipulation of data, such as keeping records, filing materials, reproducing materials, organizing written and numerical data according to a prescribed plan, operating business and data processing machines. It encourages order, clerical competencies, dependency, conformity and practicality (Holland, 1966).

The personality orientations have been operationally defined by the Vocational Preference Inventory (VPI), the Self-Directed Search (SDS) and the Strong-Campbell Interest Inventory (SCII).

It is important to note that neither a personality type nor an environmental model exist in absolute form, but rather that characteristics of all of the types will be contained in each personality type and in each environmental model. In other words, no one can be classified as, for example, just social, but every individual contains some of each personality type. Holland refers to this heirarchy as an individual's subtype or profile, and he classifies the pattern of scores such that the first score is most characteristic, and so on. Thus any person or environment can be represented by a six point code with the highest three conveying the most information (Holland, 1971).

In refining the elements of his theory in order to more adequately explain vocational selection and adjustment, Holland (1973) introduces the concepts of consistency/inconsistency, homogeneity/heterogeneity, and/or congruence/incongruence. Either individuals or environments may be consistent/inconsistent and/or homogeneous/heterogeneous.
Congruence/incongruence, however, are terms used to describe the interaction of the person and the environment.

Consistency is determined by the two high points exhibited by a person or environment. A consistent person or environment represents a high point code combination which has similar traits and is compatible. Investigative-Realistic is a consistent code because the two possess some common traits — unsociability, an orientation toward things other than people, self-depreciation, and masculinity. A realistic-social code would be inconsistent.

Homogeneity/Heterogeneity is a measure of dominance of one or two types in a personality orientation or environmental model. The concept of homogeneity refers to the degree of peakedness in a profile or the extent to which one of the types is stronger than others; a heterogeneous profile would be flat.

Congruence/incongruence refers to the fit between a person and the environment. The interaction is congruent when the individual and the environment have the same high point code. For example, an individual with a social personality orientation working in a realistic occupation would be an incongruent occupation or environment.

There are many possible combinations of consistent, homogeneous, and congruent types and models. Holland surmises that when the person and the environment are consistent, homogeneous and congruent, then the person will exhibit higher achievement, more stability and greater satisfaction.
In an earlier statement of his theory, Holland (1966) offered several "background concepts" or underlying assumptions to aid in the understanding of the theory. These assumptions were stated by Holland (1966, pp. 2-6) as follows:

1. The choice of a vocation is an expression of personality.
2. Interest inventories are personality inventories.
3. Vocational stereotypes have reliable and important psychological and sociological meanings.
4. The members of a vocation have similar personalities and similar histories of personal development.
5. Because people in vocational groups have similar personalities, they will respond to many situations and problems in similar ways, and they will create characteristic interpersonal environments.
6. Vocational satisfaction, stability, and achievement depend on the congruency between one's personality and the environment (composed largely of people) in which one works.
7. Our knowledge of vocational life is disorganized and often isolated from the main body of psychological and sociological knowledge.

The third assumption is the primary concern of this study. Holland explicated this assumption by remarking that "our everyday experience has generated a sometimes inaccurate but apparently useful knowledge of what people in various occupations are like. Thus we believe that plumbers are handy, lawyers aggressive, actors self-centered, salesmen persuasive, accountants precise, scientists unsociable, and the like"
Holland pointed out that earlier social scientist doubted the accuracy of such vocational stereotypes, but that there is now scientific evidence to show that some aspects of the stereotypes have validity. Holland cited Beardslee and O'Dowd (1966), Grune (1957), Holland (1961–1963), Roe (1956) and Super & Bachrach (1957) in support of this statement.

The Beardslee & O'Dowd (1966) study explored the existence and described the content of stereotypes held by college students for fifteen high-level business and professional occupations. The study offered no test other than the researcher's professional judgment of the validity of the stereotypes found. Roe (1956) provides a thorough summary of the pre-1957 literature describing the measured characteristics, including intelligence, aptitudes, interests, and personality traits of various occupational groups. Roe categorized and described a large variety of occupational groups in her seven-class system, but did not present empirical evidence other than casual observation concerning the validity of stereotypes.

Holland (1966) tested the hypothesis that stereotypes of occupations representing each of his six types will be consistent with his theoretical formulations of each type. Images, or stereotypes, of six vocations were obtained by asking National Merit Finalists to complete sentences such as "Physicist are ________", for six occupations representative of the six personality/environmental types: engineer, physicist, teacher, accountant, business executive, and artist. Holland stated that students of superior aptitude perceive
occupations in stereotyped ways, also that their stereotypes tend to be consistent with some of the personality variables shown to be associated with vocational choices in his previous studies.

Another area of experimentation asks how stereotypes may be defined in the literature. Such definitions often consist of subjects' responses to adjective check lists on which they have been asked to check those adjectives describing a specified occupational group member. Some researchers have used researcher-prepared list with no stated rationale for the adjectives used (Stagner, 1950; Walker, 1958). Hollander & Parker (1969; 1972) used 15 Need scales from Gough and Heilbrun's Adjective Check List and subjects checked adjectives that they thought were characteristic of specified occupational group members. Another approach feature bipolar, or semantic-differential type, rating scales on which subjects were asked to rate specific occupational groups (O'Dowd & Beardslee, 1960; Osipow, 1962).

In some studies a degree of agreement on adjectives across subjects was considered the very essence of an occupational stereotype (Holland, 1961-63; Walker, 1958). Ulrich et al. (1966) looked at mean scores on scales as an indication of stereotypes. Elmendorf (1972) asked subjects to simulate an occupational group member on the Vocational Preference Inventory (VPI) as an operational definition of occupational stereotype. Such will be the operational definition of occupational stereotype in this study, however, this study will go beyond the previous studies to look at the role of sex, race and developmental histories in accuracy of stereotypes. Researchers have acknowledged
differences in the career choices of Blacks and Whites and have indicated that these differences could largely be due to developmental differences (Kimball, Sedlacek & Brooks, 1973; Bayer & Boruch, 1969). However, very few studies have been done to attempt to identify factors which may be related to these differences.

Various researchers have already begun to examine the role of early developmental factors related to occupational sex stereotypes, however, little can be found on early stereotypes of occupations by race and how this may affect occupational choice. Holland (1966) emphasized the importance of parents and early development in the selection of an occupation when he states "as the child grows up, he learns through his parents.... He also acquires some useful though not always accurate vocational images" (p. 12).

The purpose of the present study will be to test whether: (a) college students have stereotypes of specific occupations, those of dentists and pharmacists, (b) do occupational stereotypes held by college students have a degree of accuracy, (c) are there race and sex differences in the amount of accuracy.
CHAPTER II

REVIEW OF LITERATURE

The literature review will be divided into two sections: the early and later literature on occupational stereotypes. The earlier studies on occupational stereotypes concentrated on the existence of stereotypes. The later studies, reviewed in this chapter will deal specifically with the accuracy of occupational stereotypes, the basis for this study.

EARLY LITERATURE ON OCCUPATIONAL STEREOTYPES

The early studies of occupational stereotypes can be divided into three groups based on the year of the study and the intent of the research. The very earliest studies (1930 - 1950) concerning occupational stereotypes were simply attempts to provide evidence establishing the existence of such phenomenon. The next group of studies (1950 - 1960) not only attempted to provide support for the existence of occupational stereotypes but also gave some information on their content in terms of personality traits, social variables, life style and the extent of agreement across varying subpopulations. Affiliated with the content studies are studies investigating and determining the perceptual dimensions used by students in viewing and/or
evaluating occupations. Finally, there are the studies (1960 - 1970) investigating the relationship between occupational stereotypes and other variables such as occupational preference or choice and self-concept.

Existence

The earliest studies concerning occupational stereotypes appeared soon after Lippmann's (1922) publication, *Public Opinion*, and provided evidence that occupational stereotypes exist. Surprisingly, these studies preceded the work in social psychology on ethnic and racial stereotypes. The first group of them used a "photograph methodology" to show that various groups of subjects could, at a better-than-chance expectation, correctly identify the occupations of real photographed persons. Gahagan (1933) had subjects make judgments of occupations from pairs of printed photographs. The subjects were informed that each pair of photographs contained a member of two occupational groups (e.g., men of letter and politicians). Each subject was instructed to identify these groups, and to report the bases for such judgments. The materials were photographs from current magazines. In selection, the only aim was to avoid those which were mechanically defective or which showed definite criteria (e.g., a man of science wearing a laboratory apron). The occupations were divided into two groups. One group was described as intellectual (i.e., men of science and men of letters). The other group was described as practical (i.e., politicians and business men).
The results revealed that more right than wrong judgments were made for all six comparisons of groups. The greatest difference in right and wrong judgments was found in the comparison of dissimilar groups, that is to say, in the comparison of an intellectual with a practical. The least difference in right and wrong judgments was in the comparison of two similar groups, that is, in the comparison of two intellectual or two practical groups. In other words, when subjects were presented with an intellectual and a practical group member, they made more accurate judgments than when the occupations were from the same group. Gahagan concluded that the differences were reliable.

Litterer (1933), in a similar study, use photographs from Time magazine. Instead of presenting photographs in pairs, Litterer presented the photographs of ten men and eight women, together with a list of the professions or social functions symbolized in a manner calculated to minimize the influence of position in a series. The observers (subjects) were 28 university men, 72 university women and 50 business men. Not all photographs were assigned with equal success to their proper social types or functions (professions). The differences in the accuracy of judgments probably reflected the extent to which cues were obtained from the manner of dress, facial expressions and general carriage exerted their influence. Litterer noted that the number of correct identifications exceeded a chance value to an extent which suggest the influence of stereotypes. These findings were interpreted as evidence supporting the use of occupational stereotypes on the part of subjects, thus confirming their existence. He also concluded that
the stereotypes probably grew out of a common experiential background a conclusion that is important for much of the later research on occupational stereotyping.

Ten years later, Bordin (1943) formulated a theory of the nature of vocational interest which was relevant to the question of the existence and accuracy of occupational stereotypes. He also conducted a small scale study to test his theory. This theory grew out of a reflection on Strong's (1934) and Fryer's (1931) measurement of vocational interest.

The basic theory stated that in answering a Strong Vocational Interest Test an individual is expressing his acceptance of a particular view or concept of himself in terms of occupational stereotypes. Bordin stated, as Carter (1940) has suggested, that the concept of the self is not something which appears full blown at some particular stage in the individual's development as some physiological trait might be expected to do. Rather, it is the result of a series of experiences in the individual's history which may find their focus at some early or late stage of development, depending upon the particular combination of events. To further clarify the implications of the basic assumption, two corollaries were required: (1) the degree of clarity of an interest type will vary positively with the degree of acceptance of the occupational stereotype as self-descriptive and (2) the degree of clarity of an interest type will vary positively with the degree of knowledge of the true occupational stereotype. There are two hidden assumptions in the second corollary, namely, that the occupational stereotypes implicit in the Strong Blank are true stereotypes of the
occupation involved and that all of the occupations can truly be stereotyped.

Bordin selected twenty-five subjects, graduate students, who had previously taken the Strong and showed an interest in "welfare", to retake the Strong. Out of these twenty-five, five were asked to simulate a medical pattern (Group I), six to simulate an engineering pattern (Group II), five to simulate an accounting pattern (Group VIII), four to simulate a salesman's pattern (Group IX), and five to simulate a lawyer's pattern (Group X). For the most part subjects were student in either Psychology or Educational Psychology who were attending a class in the clinical practice of counseling. To determine if subjects were successful in simulating the interest type required, the criteria used were the occupational scales, i.e., the items that differentiated occupational group members from men-in-general. Since all subjects were able to simulate the patterns of the assigned occupations on the Strong Blank, Bordin concluded that this study provided evidence to support the existence of stereotypes.

It would seem that the subjects' sophistication would invalidate the data. However, Bordin stated, "to arrive at this conclusion is to make the apparently untenable assumption that sophistication with regard to the purposes and interpretations of the test gives one knowledge of the specific weights attached to any response." However, in the case of instruments like the Strong-Campbell and other interest inventories, if one is familiar with the instrument and slightly familiar with the occupation, one may simulate occupations more accurately. Even without
knowing the weighting system of the instrument, one may be able to simulate an occupational pattern.

In questioning the subjects as to the method used in the simulation, Bordin noted an invariable response. The subjects responded that they had answered in terms of their impressions of what the typical salesman, doctor, etc. would say. In other words, Bordin contended that they were expressing their stereotypes of salesmen, doctor, etc. Bordin commented that if undergraduate students were asked to simulate interest patterns, they would yield the same results as his study with graduate students. However, it should be noted that the size of Bordin's sample was small and this could have some effect on the results.

Additional studies can be cited as providing evidence relevant to the question of the existence of occupational stereotypes and their accuracy, such as the fakability of interest inventories. All the studies demonstrate the ability of the larger proportion of the student samples to simulate successfully to some degree the patterns of specified occupational group, shifting from their own first-measured patterns. These studies spoke for the accuracy of these stereotypes within the domain measured by Strong. Some of the earlier studies (Garry, 1953; Wallace, 1950) demonstrated that some students can fake better than others, which suggested that either some students cannot succeed at the task of simulating an interest pattern or that they had inaccurate stereotypes of some occupations. This writer also contended that among those students who succeed in simulating an occupational interest pattern on the Strong, some students have more accurate
stereotypes of the occupation in question than do other students. Also, the ability to stereotype accurately on the Strong may vary across occupations.

Content

Before 1958, many of the studies (Haire & Grune, 1950; Stagner, 1950; Haire, 1955) which examined the content of occupational stereotypes were in the area of industrial relations. Studies after that period of time broadened the investigation by going beyond the industrial world to cover a wider range of occupational stereotypes. The samples during that time were primarily college students and high school students.

Grunes (1957) investigated high school students' perception of occupational groupings. The subjects were presented a list of 51 varied occupations selected to represent each of the major categories in the Dictionary of Occupational Titles. The subjects were given written instructions along with some oral clarifications. The subjects were instructed to think fast about the occupations and group the occupations as many ways as they could. For example, make groups according to what kind of people work at the jobs, what kind of work they do, etc. They were also instructed to give each group a title that tells what kind of job belongs under it.... At least two jobs were needed in each group they made.

Grunes was attempting to answer various phenomenological questions, such as, "How does the young American look at jobs?", "What groups of
jobs appear in his/her psychological field?", "What do these groups look like to the perceiving individual?", and "Do different social classes see these things differently?" Grunes believed that if we can determine what people see in occupations, we can better understand what they think and do. Specifically, we can better determine why they make their particular vocational choices, and why too many choose certain types of overcrowded fields, while too few choose others.

The resulting data were tabulated and coded to indicate jobs which tended to placed together in the same group, the grouping categories reflected in the titles, and the jobs most frequently placed under each type of title. The results showed that six clusters of occupations were found common to most students' views, and some occupations were not perceived as belonging in any cluster. Professional, business and office people were perceived as quite distinct from manual and mechanical workers. There was considerable agreement across social classes about the pattern of cluster; however, students from upper classes made sharper distinctions between business and professional people than did lower-class students. The lower class students tended to lump professional, business, clerical and sales occupations into one high prestige cluster. This finding is useful to counselors and researchers today. It requires them to be more aware of the effects of socioeconomic status on vocational choice and lays the ground for further research in this area.
In a continuation of this line of research, initiated by Grunes (1957), Gonyea (1961; 1963) explored the dimensions by which occupations are perceived by college students without prior impositions of structure from the use of an adjective checklist or rating scales. It was assumed that dimensions defined in terms of individual job perception would be more psychologically meaningful than various a priori job classifications previously proposed. The Job Perception Blank consisting of items from the Holland Vocational Preference Inventory (VPI) was administered to 100 entering male freshmen. Each subject was presented with a Job Perception Blank which consisted of two lists of occupations, side by side. Each list contained the same 30 occupational titles in differing order. Subjects were instructed to select from List B, the list on the right, the name of the job most similar to each job in List A, the list on the left.

The Andrew's A-technique (Andrews and Ray, 1957) was employed to identify the dimensions by which people, in this case college students, view occupations. The A-technique is a factor analytic approach to the determination of underlying dimensions involved in the perceptions of objects. The objects in this case being simply job titles. Like other multidimensional psychophysical methods (and unlike the semantic differential used in previous job perception research), the A-technique offered the advantage of being relatively free from response bias and entirely unrestrictive regarding the nature of the dimensions used in the perceptual task. The A-technique is generally more economical in that it permits the study of more different stimuli per subject hour.
than other methods of multidimensional psychophysics. This study employed Case III of the A-technique, the method of nonserial matching. In general, the obtained factor structure failed to conform to usual interest groupings. Holland's scales were largely obscured which suggested that job perceptions by naive college students do not necessarily correspond to conventional classifications by experts based on interest factors and/or job description. This was not to say that college students cannot classify occupations in conventional ways. However, the study suggested that when conventional dimensions were not prescribed other characteristics of the occupations may become more important (i.e., more relevant to personal needs) in the perceptions of college students.

In an earlier study, O'Dowd and Beardslee (1960) investigated the stereotypes held by college students of fifteen occupations commonly sought by male college students. They tried to determine if differences in stereotypes occurred among public university and private liberal arts college students; men and women; freshmen and seniors; high, middle and low socioeconomic subgroups; students from business and those from professional homes. They were also interested in the underlying dimensions used by students in perceiving the occupations and thus performed a factor analysis of the subsample cutting across all groups. This analysis revealed four main dimensions on which students judge occupations. These were (1) cultural intellect, (2) material and social success, (3) cheerful sociability and (4) personal control and political responsibility. To measure stereotypes, O'Dowd and Beardslee used
35-bipolar rating scales covering life, work satisfaction, personality characteristics, and social relationships associated with occupational titles.

They found that occupational titles are consistently associated with life styles, patterns of social relationships and personality traits by students. Each occupation was found to have a complex image distinguishing it from the other fourteen occupations. They also found a high agreement on these images for each occupation across the various subpopulations of students.

Hollander & Parker (1969) also investigated occupational stereotypes. These researchers contend that strong evidence is provided by the literature that stereotypes play an important role in occupational exploration and choice. However, no study has systematically investigated the occupational stereotypes of subjects younger than high school seniors. Hollander & Parker investigated the occupational stereotypes of high school sophomores. Six occupations (automechanic, scientist, teacher, bank teller, business executive, artist) were chosen, each representing one of Holland's personality orientations. Selections were based on the assumptions that these occupations were visible to adolescents. The Adjective Check List (ACL) need scale was the instrument used to test the hypotheses of the study.

An inspection of the results revealed that each ACL need scale produced significant differences in the means of the six occupational stereotypes. The results suggested that, in general, adolescents' stereotypes of the six occupations were consistent with Holland's
theoretical formulations of the categories they represented. The hypothesized ACL need scales were substantially confirmed for scientist, bank teller and business executive. Artist was partially confirmed and automechanic was not confirmed. Their findings supported the existence of stereotypes among high school sophomores and provided information concerning their content.

In summary, then, from the later 1920's through the late 1960's, researchers established the existence of occupational stereotypes, explored their content, found evidence in support of some measure of agreement across subpopulations of college students, and members of fairly visible occupations. This study also revealed that different students perceived at least some occupations in different ways.

**Occupational Stereotypes, Self-Concepts and Occupational Preference**

Beginning in the 1960's, attention turned to relationships between occupational stereotypes and other phenomenon such as self-concept, vocational preference, vocational choice. Schutz and Blocher (1960) investigated the relationship between student's occupational stereotypes, their self-concept, and their vocational preferences. The populations used in the study consisted of 135 twelfth grade males. Two instruments were developed for use in this study. One was an alphabetically arranged list of the 45 occupations commonly scored on the Strong Vocational Blank (SVIB). Subjects' description of themselves on this scale was referred to in this research as a subject's vocational preference. The second instrument was brief personality sketches
designed to correspond to the common stereotypes of typical members of occupations in ten major occupational Groups of the Strong (Groups VII and VIII were represented by one sketch). Each subject was asked to select the sketch of the personality most like himself.

Schutz & Blocher categorized subjects as consistent, i.e., those who selected as self-descriptive the personality sketch of the SVIB Group from which they had previously made their vocational preference. Significantly more students were consistent than inconsistent. The authors interpreted their research results as support for the idea that students vocational choices are influenced in part by the stereotypes they hold of different occupations.

Blocher & Schutz (1961) did another study which examined the relationship between self-concept, occupational stereotypes and vocational preferences. They hypothesized that: (1) an individual's self-description, that is, his vocational self-concept operationally defined, will be more nearly like his stereotype of a typical member of an occupation for which he expressed high interest than this same self-description will resemble the stereotype held for an occupation in which he expressed low interest, (2) a similar set of relationships would hold between description of ideal self and these two kinds of occupational stereotypes. The sample was 135 twelfth grade males. The experimental design made use of each subject's description of himself, his ideal self, and various occupational stereotypes. To obtain these descriptions, a 180-item list of words and phrases, the Descriptive Check List (DCL) was constructed using the trait clusters developed by
Cattell (1946). The null hypotheses were rejected. The subjects perceived both their self-concepts and their ideal self concepts to be more nearly similar to their stereotypes of workers in occupations with high claimed interests than to their equivalent stereotypes of workers in occupations with little claimed interests.

Studies, such as Schutz and Blocher (1960) and Blocher and Schutz (1961), indicate that fairly stable occupational stereotypes exist and that the relationship of self concept to career plans is mediated by these stereotypes. However, Simmons (1967) reported on a study in which he found no relationship between self concept-stereotype similarity to career plans of high school juniors and seniors who wanted to be engineers. Simmons used the Leary Interpersonal Checklist (1956), which provided scores on two personality dimensions (dominance-submission and love-hostility). The Leary Interpersonal Checklist was administered to obtain estimates of self-concepts and stereotypes of engineers. The students, 149 high school juniors and seniors, stated their first three career choices and were divided into "all", "any", and "no" engineering choice groups. Difference scores between self-concept and engineering stereotypes on the two dimensions were summed for each subject to obtain a similarity index. However, in this instance, there was no effect of self concept-stereotypes similarity upon career plans. Probably Simmons should not have expected them to on the instrument he used. The dimensions of the instrument seem too narrow to measure either self-concept or stereotypes.
Englander (1960) also examined self-concept and occupational stereotypes. However, she was interested in the teaching profession. The study attempted to ascertain whether or not there is a significant congruency between an individual's perception of himself and his perception of persons and situations in teaching.

It was predicted that prospective elementary teachers will tend to perceive the personal characteristics of elementary teachers as congruent with the personal characteristics of the self to a greater degree than will those persons who have selected vocations other than elementary teaching. The instrument used was an 80 item check list of statements by which any given person might be described by checking the characteristics "most descriptive" and "least descriptive" of that person. The results of this study indicated that elementary majors do perceive elementary teaching as a means of perpetuating their respective self-image and attaining those things which are desired in a vocation. On the other hand, non-education majors perceived elementary teaching as a vocation quite different from that which is expected and desired for the self. This difference may constitute the basis for their differing vocational decisions.

Hollander & Parker (1972) also did a study on self-descriptions, occupational stereotypes and their relationship to vocational choice. An adolescent population was used to determine if stereotypes of occupational preferences are related to self-descriptions. The Adjective Check List (Gough & Heilburn, 1965) was administered to obtain self-descriptions and the stereotypic descriptions of the one most
preferred occupation and the one least preferred occupation. To ascertain preferences, the Occupational Preference List (Hollander, 1967) was constructed for this study and contains 36 occupations, comprised of six occupations each for Holland's six environmental categories. Each subject described himself on fifteen need scales of the Adjective Check list of Gough and Heilbrun. The subjects were fifty-four high school sophomores. Pearson coefficients were computed between the self and the most preferred occupation and between the self and the least preferred occupation separately for each of the fifteen scales. Through z transformations, the mean correlations between self and most preferred occupations and self and least preferred occupations were also computed. On thirteen scales, significant correlations were found between self-descriptions and descriptions of preferred occupations. The overall relationship was .39 at the .01 level. Only two scales were significantly correlated between self-descriptions and descriptions of least preferred occupations. One of these was a negative correlation. It was found that only one subject selected his most preferred and least preferred occupation from the same Holland category. The study supported the conclusions that occupational choice of adolescents is influenced by the degree of positive relationship between their self-concepts and the occupational stereotypes they hold. The results of all the experimental studies have suggested that stereotypes play an important role in occupational exploration and choice.
LATER LITERATURE ON OCCUPATIONAL STEREOTYPES

The later studies, having their greatest concentration on sex-role stereotypes, can be seen in a developmental perspective. These studies have examined adult, adolescent and children's perceptions of occupations. Some researchers have suggested that race is also an important factor to consider when looking at the development of occupational stereotypes (June & Fooks, 1980; Smith, 1980). To review all the research on occupational stereotyping would be a monumental task. Thus, the following sections will review the research on sex and race differences in occupational stereotypes as it relates to the concept of accuracy of stereotypes.

Accuracy of Stereotypes

Before 1972, much of the research on occupational stereotypes centered around proving that stereotypes do exist. Only two studies had been done explicitly for the purpose of determining the accuracy or degree of accuracy of occupational stereotypes. These were Walker (1958) and O'Dowd & Beardslee (1960). Some researcher, however, will argue that the studies on fakability of the Strong Vocational Interest Blank yield information on accuracy of occupational stereotypes. However, one should keep in mind that the researchers conducting the fakability studies did not conceive these studies as providing information about stereotypes. Walker (1958) urged more research on the
nature of occupation stereotypes and their influence on occupational choice but suggested that ultimately more research is needed on their "truth or falsity".

O'Dowd & Beardslee also recognized the importance of studies that investigated the accuracy with which subjects can deliberately "fake" an interest inventory, i.e., make a pattern of scores or a score appropriated to a predesignated occupation, and provide evidence for the existence of ... occupational images. They cited Bordin's (1943) and Longstaff's (1948) studies as indicating the skill with which subjects can achieve on request various interest profiles, but they criticized such researchers for not commenting on the agreement among subjects when their attempts as "faking" were inaccurate. In this way they hint that the question of inaccuracy should be researched.

Elmendorf (1972) examined the question of inaccuracy of occupational stereotypes. Elmendorf had 120 college males simulate occupational groups on the Vocational Preference Inventory and Beer's Preference Inventory. She used a stepwise discriminant analysis to determine if the group of students responding as themselves could be discriminated from the same group of students when they were simulating, i.e., stereotyping, the assigned occupational group. The occupational groups (research chemists, high school teachers, and music instructors & college English professors) were asked to respond to these instruments. The data from these groups on the two instruments were used as criteria against which to measure the accuracy of the students' stereotypic responses. Thus accuracy would be defined as the students
ability to simulate on these two instruments in accordance with the criterion group on these two instruments.

She found that students do have stereotypic conceptions of occupational group members. However, this study found inaccuracy of stereotypes based on overall differences between groups on six scales of the Vocational Preference Inventory. Using the stepwise discriminate analysis, the students' responses simulating the three occupational group members did not correspond to those of the real occupational group members.

This information is important when considering occupational choices. Whether students are successful in finding an occupational environment which is compatible with their heirarchy of personal orientations, as Holland's theory indicated they search for, may very well depend on the accuracy of their stereotypes of the occupations they considered. If these stereotypes were as inadequate as the findings of Elmendorf's (1972) study suggested, which is likely to be the case, the search of the students for an occupation may entail a number of surprising frustrations and rejections. This rejection of occupations, due to inaccurate stereotypes, could explain the lack of females and Blacks in certain occupations.

Many researchers have found sex and race differences in occupational choice, however, few studies have examined the interaction of sex and race on career awareness and choice. Leifer and Lesser (1976) contend that "perhaps the most influential personal characteristics in career choice were sex and minority group status."
From their review they concluded that, while Anglo girls and boys apparently differ in their occupational aspirations and in personal characteristics that seemed most related to occupational attainment, comparable evidence regarding minority children is far less clearcut. They cited a number of studies indicating that while occupational attainment is clearly lower for minorities, the aspirations of minority children were generally as high as those of white children. In the case of Blacks, when social class and intelligence were held constant, aspirations may be higher than for Anglos in grades one through six, a finding confirmed by Gump & Rivers (1975). Two of the studies by Liefer & Lesser indicated that the occupational aspirations of Black girls were higher than those of Black boys, a finding congruent with that fact that a greater proportion of Black women than Black men are in professional occupations (U.S. Department of Labor, 1977; Gottfredson, 1978; Gottfreson, Holland, Gottfredson, 1975).

Both from a theoretical and an applied career counseling perspective, the accuracy and extent of a person's occupational stereotype is vital for adequate vocational planning. However, a review of the vocational literature has revealed few studies that have dealt with accuracy of stereotypes, and even fewer have looked at sex and race differences in occupational stereotyping. Thus more research is needed on the accuracy of stereotypes, as well as sex and race differences in accuracy of stereotypes.
Sex Differences in Occupational Stereotyping

Despite recent progress in challenging the barriers to entry into previously male-dominated professions, women still face many significant obstacles in achieving success in non-traditional fields (O'Leary, 1974). O'Leary contended that both external and internal factors are related to this lack of success. One internal factor in which the evidence continues to accumulate is sex-role stereotyping. Sex-role stereotyping suggests that certain occupations are perceived as more appropriate for males or for females.

Panek, Rush & Greenawalt (1977) in an investigation of this hypothesis, presented college undergraduates with a list of 25 occupations and asked them to judge whether the occupations were male, female or neutral. They found that 15 of the 25 were associated with either males (8) or with females (7), rather than neutral. The male occupations include lawyer, police officer, medical doctor, and office manager while the female occupations included elementary school teacher, typist, librarian and nurse. These results suggested that, even though attempts have been made by the feminist movement to change societal attitudes toward women entering various occupational fields, traditional sex stereotypes still exist with regard to many occupations. Since sex-stereotyping of occupations in the present study was found in a college population, subjects who would be expected to be progressive in their attitudes, it appears that there is still a great deal of progress
to be made in changing attitudes toward women in certain occupations (Greene, 1976; O'Leary, 1974).

In a related study, Albrecht, Bahr and Chadwick (1977) reported a similar pattern in a large sample survey of Utah residents. A list of 15 occupations were presented to respondents; nine were judged as only or more suitable for men (e.g., doctor, scientist, lawyer, congressman), and only three were viewed as only or more suitable for women (e.g., secretary, nurse, housekeeper). This list employed in these studies were limited, and possibly biased toward male-dominated occupations. One should keep in mind the homogeneity of this group, being residents of Utah.

These findings have layed the ground for research with younger age groups. Mischel (1970) contends that adults model and are presumed to be responsible for many of the behaviors and attitudes children develop. If this is the case, children might be expected to exhibit similar occupational stereotypes. Research on related behaviors indicated that highly sex-typed stereotypes are apparently effectively transmitted to young children. A considerable body of developmental research demonstrates that children develop highly sex-typed activity preferences and behavior as early as age three (see Maccoby & Jacklin, 1974, for a review).

Most developmental research specific to the area of sex-related occupational stereotypes has compared children's personal vocational preferences with societal stereotypes. The research has consistently shown sex differences in the expression of vocational aspirations as
Children's commonly expressed occupational aspirations reflect clear and consistent sex differences. Overlap between the occupations desired by girls and by boys is nearly nonexistent (e.g., Kriedberg, Butcher & White, 1978; Looft, 1971a; 1971b; Papalia & Tennent, 1975). Looft (1971a) used a sample of 41 second grade females. When asked what they wished to become, these girls uniformly nominated "traditional" vocations (i.e., vocations such as teacher or housewife) which are socially identified with the sex of the child. Looft interpreted this emphasis upon traditionally as indicative of girl's orientation toward the more traditional sex-role expectations. Another salient feature of the girl's responses was the narrowness in the variety of vocations nominated.

In his second investigation, Looft (1971b) examined sex differences in vocational aspirations among 66 first and second grade males and females. Looft (1971b) predicted that boys generally perceive a wide range of opportunities open to them and thus will name more occupational categories than girls. Further, occupational "foreclosure" may occur earlier in girls, and thus boys will be more susceptible to encouragement to change their initial nominations. The results of the investigation supported Looft's prediction: 18 different (nonoverlapping) vocations were nominated by the male subjects, whereas only 8 different vocations were nominated by the female subjects.

Kriedberg, Butcher & White (1978) did a similar study. Kriedberg et al. stated that even though Looft (1971a, b) regards his study as
further support for his interpretation of early acquisition of traditional sex-role expectations, the lack of an older contrast group in the study weakens his argument. Kriedberg et al. replicates Looft's (1971b) study with the inclusion of an older (sixth grade) comparison group. The study was comprised of 20 second grade and 20 sixth grade students. Kriedberg et al. found no significant differences between male and female subjects of the second and sixth grade in either the number of different vocations nominated or the number of subjects changing their original vocational choices. However, they did find that second-graders as a group nominated traditional vocations significantly more often than nontraditional vocations. Differences in the results of the two studies could be due to the small sample size of each group in the Kriedberg et al. study.

However, Gettys & Cann (1981) contend that expressing sex-typed occupational aspirations is not the same as perceiving the occupation as stereotypically male or female. They attempted to examine more directly children's perceptions of particular occupations. In addition, children younger than those previously tested are included to assess any developmental changes in perception. The subjects were 155 preschool and first grade children ranging in age from 2 1/2 to 8 years. The experimenter informed the child that they would play a game. The experimenter called out the names of some jobs and instructed the child to point to the doll that might do that job. The child was informed that there were no right or wrong answers. The results revealed little doubt that young children not only selected sex-stereotyped appropriate
occupations for themselves, but they also recognized that the occupations are filled by males or females. They concluded that even though boys and girls showed differences in the expressed preferred professions, these differences merely reflect equivalent recognition of the sex-roles involved.

A question that is related to the issue of occupational sex stereotyping, but which had not been addressed in the research before 1983, involves the impact of these stereotypic beliefs on judgments of competency at occupations. Children may recognize that females, not males, are more "appropriately" employed as secretaries, while males, not females, more "appropriately" work as police officers, as reflected in the stereotypes of their adult models. This could be held without holding the associated belief that one sex is intrinsically better able to perform the occupation.

Cann & Haight (1983) examined children's perceptions of relative occupational competence as a function of the sex of the occupation and the sex of the performer. Like the Gettys & Cann (1981) study, subjects were presented with some jobs and instructed to point to the doll (male or female) which they thought would do the job best. The children were informed that both of these people do each of the jobs and there are no right or wrong answers. The subjects were 173 children from grades k, 1, 2.
Cann and Haight believed that if children have fully integrated the adult stereotypes concerning the occupations, differences equivalent to those reported in the research on stereotype recognition should emerge. They also examined developmental changes, since researchers have reported increasingly flexible stereotypes (Garrett et al., 1977) and more clearly defined stereotypes (Gettys & Cann, 1981) as a function of age.

The results revealed that young children evidently have clearly defined expectations concerning competence in occupational roles. The expectations correspond to societal sex stereotypes, children at each age level significantly discriminated on the basis of sex: matching the "female" occupations with the female doll, and the "male" occupations with the male doll. The sex differences, while significant, produced a very slight variation and may represent a tendency to select the same-sex doll when one is unsure of a response.

These results provided an extension of our understanding of occupational stereotyping in children by demonstrating the impact these sex stereotypes have on the children's evaluative judgments. Children's belief that sex-appropriate individuals will be "better" in a career role have potentially more serious implications than previous demonstrations of sex-stereotype recognition. Given that the children believe competence is dependent upon the sex of the incumbent, an important issue becomes the reactions of children to people in "inappropriate" professions.
The research on sex differences in occupational stereotyping has concentrated on the sex-typing of occupations. Even though the question of how accurately individuals can predict which occupations are traditionally male or female has important implications, it does not tell anything about an occupation. An important question to ask is "How accurate are the stereotypes individuals have about certain occupations?" The accuracy of stereotypes are based on the information or knowledge that the individual has obtained about the occupational interest patterns of the typical member of that occupation.

A 5-year review of the vocational guidance literature revealed that few studies dealt with awareness of occupations and information sources (Holcomb & Anderson, 1982). Several studies suggested; however, that high school students' knowledge of the world of work is not extensive. McLure & Piel (1978) performed a study on 1000 talented high school females. These females reported that one of several barriers they perceived to entering nontraditional fields was a lack of information about careers in science and technology. There is also some evidence that the situation is not much better among college students. Yanico (1980) found that a sample of college students rated themselves as having relatively little information about the number of fairly common occupations. Although knowledge about occupations and occupational information is presumed to be vital to the career development process, few studies have investigated these variables.

Few studies have investigated the possibility of sex differences in occupational knowledge. Yanico (1980) predicted that both college men
and women would report a lack of information about occupations that are nontraditional for their sex. The participants were college students enrolled in an introductory psychology course. Subjects were given 20 occupational titles and asked to rate, on a scale from 1 to 7, the amount of information they had about the occupation. The lower the rating the greater the amount of self-reported knowledge. Seven of the occupations were stereotyped as masculine occupations, thus these occupations were considered traditional for men and nontraditional for women. Seven occupations were also selected that were considered traditional for women and nontraditional for men. Six occupations were considered neutral occupations; these occupations have no consistent gender stereotype. The results showed that women perceived themselves as less informed about occupations that are nontraditional for women than about traditional female occupations. College men, on the other hand, estimated they were equally knowledgeable about traditionally male and female occupations and rated themselves as knowledgeable as women about "women's" fields.

Studies by Grotevant and Durrett (1980) and Loesch, Shub & Rucker (1978) did not find differences in occupational knowledge based on sex. Grotevant & Durrett (1980) used a sample of 6029 high school seniors (3023 males and 3006 females) varying in size, ethnic membership, and economic background. The results of the study did support earlier conclusions that the occupational knowledge of high school students was very limited. They found students lacked two types of knowledge (1) accurate knowledge about the education requirements of careers they
wished to enter, and (2) knowledge of the vocational interests predominantly associated with their occupational choices. Several sex differences emerged from these data, however, sex differences were not striking.

This information is important for counselors. Grotevant & Durrett (1980) states that if the function of career education and counseling is to facilitate decision making and reality testing in order to optimize the degree of congruency between the students and their occupational choices, it appears that high school seniors need more information about potential occupational choices. In particular, they felt that both sexes need greater understanding of (1) the educational background required to enter a broad range of occupations, (2) the vocational interests and types of work environments predominantly associated with those occupations, and (3) the need to use this information as they make occupational decisions.

Yanico and Milbauer (1983) criticized the Grotevant & Durrett (1980) study because they did not mention whether there were differences in patterns of job knowledge, i.e., whether the sexes differ in their actual knowledge of gender traditional and nontraditional occupations. Yanico & Milbauer (1983) investigated whether or not students' self-estimated occupational knowledge accurately reflects actual knowledge. The study was the replication of the Yanico (1980) study which investigated students' self-reported knowledge about traditionally male vs. traditionally female occupations.
Yanico and Milbauer used 58 college students, 29 males and 29 females, enrolled in an introductory psychology course. The subjects occupational information was measured by the Job-Career Key (JCK). The results of the study partially replicated those found in the Yanico (1980) study. Specifically, a sample of college women predicted they knew less about occupations that are gender nontraditional, or female-dominant. The results show that men again did not differ from women in ratings of female occupations; however, contrary to earlier findings, men did rate themselves as less informed about female-dominant than male-dominant occupations. Also the study revealed that when predicted knowledge is compared with actual knowledge, it appears that both sexes tend to underestimate, to some extent, what they know about non-traditional fields. One limitation of this study, however, is the small sample size.

These studies revealed that more research is needed on sex differences in occupational information. One means of examining this is through occupational stereotypes. The present study will measure differences in students' ability to predict interests most predominantly associated with specific occupations. Grotevant & Durrett (1980) predicted that may lack information about vocational interests associated with various occupations and the types of work environments most predominantly associated with their occupations. As noted earlier, more research needs to be done on sex differences in career choice and occupational stereotypes.
Race Differences in Occupational Stereotyping

Many researchers are beginning to explore race differences in career choice. Smith (1975) notes that after a long period of neglect, vocational psychologists and counselors are beginning to focus their attention on the career development of Black individuals. Much of this interest is reflected in the relatively recent increase in the number of studies which have investigated the vocational aspirations, interests, choices, the maturity of Black adolescents as well as the job attitudes, job values, and work satisfaction of Black adults.

This review could find only one study which looked at ethnic differences and occupational stereotypes. Frost & Diamond (1979) explored the interaction of sex with ethnicity and its effect on career awareness of children. Their sample was 21 fourth-, fifth-, and sixth-grade classrooms. Data were gathered through the use of a paper and pencil questionnaire. Subjects were asked to put an "X" in the space, if they thought the adult job could be done by a man or a woman or both. An analysis of occupational choice by ethnic group separately by sex indicated no significant differences in patterns of male Blacks, Hispanics, and Anglos. Very few boys of any ethnic group indicated a choice of a female-stereotyped job. Most boys of all ethnic groups chose jobs traditionally for their own sex. For girls, however, choice patterns did differ significantly. Anglo girls chose jobs stereotyped for males more frequently than Blacks or Hispanics did. Even the Elmendorf (1972) study of accuracy of stereotype excluded race as a factor. However, Elmendorf does mention a control for sex by using an
all male sample.

One area which is indirectly related to research on occupational stereotyping is vocational maturity. Vocational maturity has been primary among the constructs used to investigate knowledge of careers. Most frequently, occupational knowledge has been identified and measured as the extent to which children and adolescent possess and demonstrate accurate and realistic knowledge about certain occupations and/or their preferred occupations. In the vocational maturity studies, the occupational information variable is considered to be what the person has learned about the external world. The child or adolescent is judged according to the amount of accurate information demonstrated.

For the most part, research on the vocational maturity of Black adolescent has tended to be largely comparative in nature, that is, investigators have been inclined to compare the vocational development of Blacks with their White counterparts. Vriend (1969) also investigated the vocational maturity of inner-city youth from lower socioeconomic backgrounds. Although both Black and White subjects were used, no racial comparisons were made between the two groups. Using an instrument he developed himself (Vocational Maturity Rating Scales - VMR), Vriend found that second-semester seniors who had been exposed to a 2-year vocational program obtained higher group VMR's in all component areas than those who were placed in control groups and not exposed to any special kind of vocational program.

Generally speaking, lower socioeconomic Black youth have been characterized as being less vocationally mature than middle class
Whites. However, in interpreting the results of the studies cited, none of the reported investigations have been able to ascertain to what extent the vocational immaturity of lower socioeconomic Black youth can be associated with their social class or racial membership group.

More research needs to be done on race and sex differences in perceptions of occupations. Consequently, the present study was conceived. Again, this study will address the questions, "Do college students have stereotypes of selected occupations? and are there race and sex differences in the degree of accuracy?"
CHAPTER III

METHODS

This study will examine the extent to which college freshmen have accurate perceptions of specified occupations. College freshmen were asked to respond to Holland's Self-Directed Search in the manner they thought specified occupational group members would. Since the occupations selected were classified as "traditionally White-male" oriented occupations, sex and race differences in simulation scores were expected. Thus, the study will go beyond the question of accuracy to examine sex and race differences in student perceptions.

Hypotheses

The following hypotheses were tested:

1. Based on Helson (1964), when people make judgments about human behavior, they employ frames of reference in which their own behaviors serve as "anchoring stimuli". Thus, students' predictions of professionals' profiles will lie in the closed interval between the normative sample profile and the profile of the criterion groups. In particular,

A. The means of the students' predictions will lie in the closed interval between the normative sample means and the criterion group means.

B. The means of the students' predictions will tend to fall at three points: (1) near the normative sample when the students do not perceive the relevance of the scale to the stereotype they are predicting, (2) near the criterion sample when the students accurately perceive the relevance of the scale to the stereotype, (3) at some intermediate point that is common to all scales having means significantly different from criterion and normative samples.
C. The intercorrelations of the students' predictions will lie in the closed interval between the normative sample intercorrelations and the criterion group intercorrelations.

2. Since the occupations selected were "traditionally male-dominated" occupations, sex differences in students perceptions of specified occupations were expected on the scales of the Self-Directed Search. In particular,

A. Males will make significantly more accurate judgments than females on the first letter code of the SDS.

B. Males will make significantly more accurate judgments than females on the second and third letter codes of the SDS.

C. Even when high point codes are not considered, males will be significantly different from females on the six scales of the SDS.

3. Since the occupations selected were "traditionally White-dominated" occupations, race differences in students perceptions of specified occupations were expected on the scales of the Self-Directed Search. In particular,

A. Whites will make significantly more accurate judgments than Blacks on the first letter code of the SDS.

B. Whites will make significantly more accurate judgments than Blacks on the second and third letter codes of the SDS.

C. Even when high point codes are not considered, there will be significant differences in the mean vectors for Blacks and Whites on the six scales of the SDS.

In hypothesis 1, the term "closed interval" is used. Closed interval is used to include the end-points. In this study, the endpoints or boundaries are the mean scores for the criterion sample and the normative sample. However if the means of the students' predictions fall outside the endpoints and are not significantly different from the endpoints, then these will also be included as falling within the boundaries (lying in the closed interval between the criterion and
normative sample means).

In addition to the above research hypotheses, several other questions were considered in this research. The questions are:

1. Are students able to predict the interest patterns of one occupation better than the other?

2. Are there differences on the mean simulation scores across the six scales of the SDS.

**Instruments**

The Self-Directed Search and a Biographical Data Questionnaire were administered to each subject. The Self-Directed Search (SDS; Holland, 1977) is a self-administered instrument which consists of two booklets, and an Occupations Finder Booklet. Additionally, the SDS includes Occupational Daydreams (a measure of aspirations history), six Activities scales of 11 items each, six Competencies scales of 11 items each, six Occupations scales of 14 items each and two sets of Self-Estimates involving personality types, and represents an expansion of the Vocational Preference Inventory (VPI).

The SDS has reliability coefficients of internal consistency ranging from .53 to .87 (Holland, 1971). Studies by O'Connel and Sedlacek (1972) and Zener and Schuelle (1972) show test-retest reliability coefficients ranging from .73 to .92 with a 7 to 10 month lapse using 65 freshmen. In summary, findings indicate that the SDS is a reliable instrument.
The Biographical Data Questionnaire was used to collect personal information such as age, sex, race, employment history, education, etc.

Study Participants

The participants in this study will consist of three groups: a criterion sample, an experimental sample, and the normative sample (data taken from the Self-Directed Search Manual, 1979). Since research is needed to validate Holland's theoretical predictions concerning his occupational classification, members of each occupational group were contacted and asked to complete the SDS. This group will be referred to as the criterion sample. The criterion sample consisted of two occupational groups: 20 Pharmacists and 20 Dentists.

According to Holland's theoretical prediction, the three letter code for pharmacists is Investigative-Enterprising-Social. The criterion group of pharmacists supported Holland's prediction on the first letter code but the second and third letter codes were reversed. Based on Holland's conception, the difference was not significant. Since the order of the second and third letter codes was not deemed important, it was believed that the criterion sample supported Holland's prediction. Holland's three letter code for dentists was Investigative-Social-Realistic. The dentists supported Holland's theoretical predictions on all three codes.

The occupations (Pharmacist and Dentist) were selected from the Occupational Finder which classifies occupations according to their three digit classification code and the level of education an occupation
requires. The levels are coded 1 through 6. Levels 1 and 2 mean that an occupation requires only elementary school training or no special training at all. Levels 3 and 4 mean high school and some college, technical or business training is needed. Levels 5 and 6 mean college training is necessary (Holland, 1974). The occupations were selected from Holland's Investigative personality type and the levels were selected based on previous research. Gottfredson (1978) and Gottfredson, Holland & Gottfredson (1975) studied the number of jobs in the United States categorized according to Holland's classification. They found that females and Blacks were under-represented in high levels of Investigative types of work. Based on the above research, it was hypothesized that the dearth of females and Blacks in these occupations may be related to the stereotypic perceptions of these two groups.

The experimental sample for this study consisted of 200 volunteer college freshmen. The total sample was divided into two groups of 100 subjects each. The subjects were 100 males (50 Blacks and 50 Whites) and 100 females (50 Blacks and 50 Whites). The subjects were solicited from Introductory Psychology and University College courses at The Ohio State University. The age range was 17 years to 30 years with a mean age of 18.47 years. Table 1 represents a breakdown of the subjects by race, sex, and occupation simulated.

Since the subjects in this study did not respond to the Self-Directed Search for themselves, data was used from the normative sample to make comparisons. The normative sample data was taken from the Manual for the Self-Directed Search and was used basically in
<table>
<thead>
<tr>
<th>OCCUPATION SIMULATED</th>
<th>Pharmacists</th>
<th>Dentists</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Blacks</td>
<td>Whites</td>
</tr>
<tr>
<td>SEX</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Males</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Females</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>TOTAL</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>
**hypothesis 1.**

**Procedure**

The subjects were recruited from the State of Ohio. The experimental sample was taken from two courses. The Psychology 100 students were participating in the study as a means of fulfilling their psychology experiment requirements. The remaining subjects were obtained from several University College courses. The researcher approached the teachers of the classes and arranged times at which subjects could be solicited. Each subject was given a data packet containing an introduction to the study, instructions, a Biographical Data Questionnaire (see Appendix A) and Holland's Self-Directed Search. The confidentiality of the subjects and the importance of returning completed questionnaires was stressed. The instruments were grouped in a packet and coded by number.

The criterion sample (Pharmacists and Dentists) was approached by the experimenter and asked to complete the questionnaire at their convenience. The initial contact was done by phone or through a liaison person. The researcher delivered the test material to all areas. Each subject was given a data packet containing an introduction, an instruction sheet and Holland's Self-Directed Search. The materials were picked up from the subjects at a later date. Feedback was provided to all subjects who desired it.

In order to examine sex and race differences, each subject was given two accuracy scores. Accuracy scores are defined as the student's...
ability to predict the three-digit classification of the criterion sample (OCPH and OCDE). The first and most important score, accuracy score 1 (ACC1), was derived from the subjects' ability to predict the first letter code for Pharmacists and Dentists. The second accuracy score (ACC2) was derived from the subjects' ability to predict the second and third letter codes for pharmacists and dentists. This scoring is important in the interpretation of the hypotheses.

Statistical Analyses

The following analyses were performed to test the hypotheses. Means, standard deviations, and intercorrelations were reported for the normative sample (SDS; Holland, 1977), the simulation group and for the two occupational groups. Chi-squares were performed to examine sex and race differences in accuracy scores. The accuracy scores examined differences on the three high point codes for the Self-Directed Search, based on Holland's theoretical predictions. However, Parker (1983) suggests that important group differences may be found in the low point codes of the Self-Directed Search. Thus multivariate analyses of variance were performed to examine differences by race and sex on all of the scales of the SDS.
CHAPTER IV

RESULTS

This chapter will present the findings derived from the use of Holland's Self-Directed Search (SDS; Holland, 1977). The chapter will be divided into three sections. The three sections are: Hypothesis 1: Occupational Stereotypes, Hypothesis 2: Sex Differences and Hypothesis 3: Race Differences.

HYPOTHESIS 1: Occupational Stereotypes

Based on Nelson (1964), when people make judgments about human behavior, they employ frames of reference in which their own behaviors serve as "anchoring stimuli". Thus, students' predictions of professionals' profiles will lie in the closed interval between the normative samples' profiles and the profiles of the criterion group. In particular,

A. The means of the students' predictions will lie in the closed interval between the normative sample means and criterion group means.

B. The means of the students' predictions will tend to fall at three points: (1) near the normative sample when the students do not perceive the relevance of the scale to the stereotype they are predicting, (2) near the criterion group when the students accurately perceive the relevance of the scale to the stereotype, (3) at some intermediate point that is common to all scales having means significantly different from the criterion and normative samples.
C. The intercorrelations of the students' predictions will lie in the closed interval between the normative sample's intercorrelations and the intercorrelations of the criterion group.

Since self-ratings for the experimental sample of students was not obtained on the Self-Directed Search, the self-ratings were obtained from the normative data on the test. Table 2 presents the means and standard deviations of the normative sample (by male and female self estimates), experimental groups (by males and females) and the criterion groups.

**Means of Pharmacist Groups**

Differences between the criterion and normative sample means were expected on all six scales of the SDS. Thus, t-tests were performed to examine differences between the criterion group of pharmacists and the normative sample of students (males and females separately). The two male groups differed significantly (p < .025) on five scales of the SDS (not Artistic). On the Investigative, Social, Enterprising, and Conventional scales, the normative sample had significantly lower means than the criterion group. However, on the Realistic scale, the male normative sample had a significantly higher mean than the criterion group.

When the female norms used, the criterion group was also significantly different from the normative sample. The two groups differed on 5 scales of the SDS (not Social). On the Realistic, Investigative, Enterprising and Conventional scales, the normative
TABLE 2
Means & Standard Deviations of Normative Sample, Experimental Sample and Criterion Sample

<table>
<thead>
<tr>
<th>SCALES</th>
<th>NORMATIVE SAMPLE</th>
<th></th>
<th>EXPERIMENTAL GROUP</th>
<th></th>
<th>CRITERION GROUP</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MALES (N=578)</td>
<td>FEMALES (N=560)</td>
<td>MALES (N=50)</td>
<td>FEMALES (N=50)</td>
<td>MALES (N=50)</td>
<td>FEMALES (N=50)</td>
</tr>
<tr>
<td>INVESTIGATIVE</td>
<td>26.38 10.08 22.21 9.20</td>
<td>35.92 7.86 38.08 15.60</td>
<td>33.35 7.22 32.86 8.31</td>
<td>35.20 7.00 36.45 9.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SOCIAL</td>
<td>28.86 8.38 34.35 6.96</td>
<td>28.25 6.02 34.72 13.81</td>
<td>30.82 6.63 34.48 6.58</td>
<td>32.65 9.00 32.20 9.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENTERPRISING</td>
<td>24.49 9.76 19.53 8.11</td>
<td>29.08 8.79 31.36 12.95</td>
<td>27.68 7.98 27.34 6.34</td>
<td>30.60 9.29 28.30 9.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONVENTIONAL</td>
<td>18.64 9.59 17.56 8.59</td>
<td>25.56 9.35 28.56 15.26</td>
<td>21.08 8.65 21.46 8.04</td>
<td>28.65 7.08 18.05 9.58</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
sample had significantly lower means than the criterion group. However, on the Artistic scale, the female normative sample had a significantly higher mean than the criterion group. Table 3 presents the t-tests for the six scales of the SDS for both males and females.

In the pharmacist group, the simulation means were predicted to fall in the closed interval between the normative sample means and the criterion sample means. For males, the simulation mean scores on the Realistic, Enterprising and Conventional scales fell in the closed interval between the normative sample means and the criterion sample means. On the Investigative, Artistic and Social scales, the students' predictions did not fall between the normative sample means and the criterion sample means. However, the t-tests for differences between the simulation group and the closest boundary (either the normative sample or the criterion sample) were not significant. Thus, the simulation means on these three scales were also included as falling within the closed interval between the normative sample and criterion sample of pharmacists. In summary, on all the scales of the SDS, the simulation means for the pharmacist group of males fell in the closed interval between the normative sample and the criterion sample of pharmacist.

When the criterion and normative samples were significantly different and the student's predictions fell between the criterion and normative samples, additional analyses were performed. On three scales, Realistic, Enterprising and Conventional, the normative and criterion sample differed significantly with simulation means falling between the
TABLE 3

T-Tests for Differences between the Normative Sample (by Males and Females) and the Criterion Sample of Pharmacists

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>Males (df=596)</th>
<th>Females (df=878)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>3.31*</td>
<td>-2.07**</td>
</tr>
<tr>
<td>Investigative</td>
<td>-3.85*</td>
<td>-6.88*</td>
</tr>
<tr>
<td>Artistic</td>
<td>-0.91</td>
<td>1.78**</td>
</tr>
<tr>
<td>Social</td>
<td>-1.95**</td>
<td>1.04</td>
</tr>
<tr>
<td>Enterprising</td>
<td>-2.75*</td>
<td>-6.02*</td>
</tr>
<tr>
<td>Conventional</td>
<td>-4.53*</td>
<td>-5.57*</td>
</tr>
</tbody>
</table>

*p < .0005

**p < .025
two groups. In these cases, the students' predictions were expected to fall at three points: near the normative sample, near the criterion sample, or at some intermediate point (different from both criterion and normative sample). T-tests were performed to see if the students' predictions were significantly different from the criterion sample on these scales. On all three scales, the students' predictions were not significantly different from the criterion sample. Thus the means simulation scores for the Realistic, Enterprising and Conventional scales fell near the criterion sample on these scales.

For females, the simulation means scores on the Artistic and Conventional scales fell in the closed interval between the normative sample means and the criterion sample means. On the Realistic, Investigative Social and Enterprising scales, the students' predictions did not fall between the normative sample means and the criterion sample means. However, t-tests for differences were not significant. Thus, the simulation means on these four scales were also included as falling within the closed interval between the normative sample and the criterion sample.

Again, when the criterion and normative samples were significantly different and the students' predictions fell between the criterion and normative samples, additional analyses were performed. This occurred on two scales for the females: Artistic and Conventional. In this case, the students' predictions were expected to fall at three points: near the normative sample, near the criterion sample, or at some intermediate point (different from both criterion and normative samples). T-tests
were performed to see if the students' predictions were significantly different from the criterion sample on these scales. On both scales, the students' predictions were not significantly different from the criterion sample. Thus, the mean simulation scores fell near the criterion sample.

Means of Dentist Groups

Differences between the normative and criterion samples were again expected on all six scales of the SDS. Thus t-tests were performed to examine differences in the normative sample of students (males and females separately) and the criterion group of dentists. The male normative sample was significantly different than the criterion group on three scales of the SDS (Realistic, Investigative, and Social). The male normative sample had significantly lower means than the criterion group on these scales.

When female normative sample means were used, the two groups differed significantly on five scales (not Conventional). On the Realistic, Investigative, Artistic, and Enterprising scales, the female normative sample had significantly lower means than the criterion group. However, on the Artistic scale, the female normative sample had a significantly higher mean than the criterion group. Table 4 presents the t-tests for the six scales of the SDS for both males and females.

In the dentist group, the simulation means were expected to fall in the closed interval between the normative sample means and the criterion sample means. For males, the simulation mean scores on the
### TABLE 4

**T-Tests for Differences between the Normative Sample (by Males and Females) and the Criterion Sample of Dentists**

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>Males (df=596)</th>
<th>Females (df=878)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>-11.05*</td>
<td>-11.40*</td>
</tr>
<tr>
<td>Investigative</td>
<td>- 4.40*</td>
<td>- 6.88*</td>
</tr>
<tr>
<td>Artistic</td>
<td>* - .37</td>
<td>2.36**</td>
</tr>
<tr>
<td>Social</td>
<td>- 1.98**</td>
<td>1.13***</td>
</tr>
<tr>
<td>Enterprising</td>
<td>- .83</td>
<td>- 4.64*</td>
</tr>
<tr>
<td>Conventional</td>
<td>.26</td>
<td>.25</td>
</tr>
</tbody>
</table>

* p < .0005

**p < .05

***p < .10
Investigative, Artistic, Social and Enterprising scales fell in the closed interval between the normative sample means and the criterion sample means. On the Realistic and Conventional scales, the students' predictions did not fall between the normative sample means and the criterion sample means. However, on the Realistic scale, the t-tests for differences were not significant. Thus, the simulation mean on this scale was also included as falling within the closed interval between the normative sample and the criterion sample of dentists. On the Conventional scale, the simulation scores fell outside the boundaries below the normative sample means. The male simulation mean was significantly different from the normative sample mean, t = 1.74 (p < .05). Thus in summary, five scales of the Self-Directed Search (not Conventional) supported hypothesis 1A for dentists.

When the criterion sample of dentists were significantly different from the normative sample and the simulation scores fell in between the two groups, additional analyses were performed. This was the case on the Investigative and Social scale for males. In this case, the students' predictions were expected to fall at three points: near the normative sample, near the criterion sample, or at some intermediate point (different from the criterion and normative sample). T-tests were performed to see if the students' predictions were significantly different from the criterion sample on these scales. On both the Investigative and Social scales, the students' predictions were not significantly different from the criterion sample. Thus, the mean simulation scores fell near the criterion sample.
For females, the simulation mean scores on the Realistic, Investigative, Artistic and Enterprising scales fell in the closed interval between the normative sample means and the criterion sample means. On the Social and Conventional scales, the students' predictions did not fall between the normative sample means and the criterion sample means. However, on the Social scale, the t-tests for differences was not significant. Thus, the simulation mean on the Social scale was also included as falling within the closed interval between the normative sample and the criterion sample of dentists. On the Conventional scale, the simulation mean fell outside the boundaries below the normative sample means. The female simulation mean was significantly different from the normative sample mean, t = 1.52 (p < .10). Thus in summary, five scales of the Self-Directed Search (not Conventional) supported hypothesis 1A for the female dentist group.

When the criterion sample of dentists were significantly different from the normative sample, additional analyses were performed. This was the case on the Realistic, Investigative, Artistic and Enterprising scales for females. Again, in this case, the students' predictions were expected to fall at three points: near the normative sample, near the criterion sample, or at some intermediate point (different from the criterion and normative samples). T-test were performed to see if the students' predictions were significantly different from the criterion sample on these scales. On the Investigative, Artistic and Social scales, the students' predictions were not significantly different from the criterion sample. However, on the Realistic scale, the students'
predictions were significantly different from the criterion sample. Thus, the mean simulation scores fell near the criterion sample on the Investigative, Artistic and Social scales and near the normative sample on the Realistic scale.

In summary, the results of the analyses supported the hypothesis. The pharmacist simulation means for both males and females fell in the closed interval between the normative sample and the criterion sample of pharmacists. The dentist simulation means for both males and females fell in the closed interval between the normative sample and the criterion sample of dentists on five scales of the SDS (not Conventional). The simulation intercorrelations of pharmacists and dentists fell in the closed interval between the normative sample's intercorrelation and the criterion sample's intercorrelations.

### Intercorrelations for Pharmacist and Dentists

Table 5 presents the intercorrelations for the normative sample (by males and females) on the six scales of the Self-Directed Search. All values are relatively low, falling between -.34 and .46 with an average intercorrelation of -.038. Table 6 presents the intercorrelations of the scores from the pharmacist simulation group and the pharmacist criterion group. The average intercorrelations for the pharmacist simulation group was .249 with a range of -.1069 to .4811. The average intercorrelation for the pharmacist criterion group was .495 with a range of .2166 to .6485. Table 7 presents the intercorrelations for the dentist simulation group and the dentist criterion group. The average
TABLE 5

Intercorrelations of SDS Scales Among Normative Sample

<table>
<thead>
<tr>
<th></th>
<th>R</th>
<th>I</th>
<th>A</th>
<th>S</th>
<th>E</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic (R)</td>
<td>XXXX</td>
<td>.39</td>
<td>-.04</td>
<td>-.11</td>
<td>.02</td>
<td>.13</td>
</tr>
<tr>
<td>Investigative (I)</td>
<td>.22</td>
<td>XXXX</td>
<td>-.14</td>
<td>-.20</td>
<td>-.29</td>
<td>-.04</td>
</tr>
<tr>
<td>Artistic (A)</td>
<td>-.17</td>
<td>-.08</td>
<td>XXXX</td>
<td>-.12</td>
<td>-.12</td>
<td>-.24</td>
</tr>
<tr>
<td>Social (S)</td>
<td>-.34</td>
<td>-.24</td>
<td>.02</td>
<td>XXXX</td>
<td>.25</td>
<td>.13</td>
</tr>
<tr>
<td>Enterprising (E)</td>
<td>-.27</td>
<td>-.31</td>
<td>-.03</td>
<td>.46</td>
<td>XXXX</td>
<td>.19</td>
</tr>
<tr>
<td>Conventional (C)</td>
<td>-.06</td>
<td>-.12</td>
<td>-.17</td>
<td>.10</td>
<td>.28</td>
<td>XXXX</td>
</tr>
</tbody>
</table>

Men are below and women are above the diagonal formed by the Asteriks (XXXX).
TABLE 6

Intercorrelations** for Pharmacist Simulation and Criterion Groups

<table>
<thead>
<tr>
<th></th>
<th>R</th>
<th>I</th>
<th>A</th>
<th>S</th>
<th>E</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic (R)</td>
<td>XXXX</td>
<td>.4869</td>
<td>.3764</td>
<td>.3518</td>
<td>.2166</td>
<td>.2619</td>
</tr>
<tr>
<td>Investigative (I)</td>
<td>.1119</td>
<td>XXXX</td>
<td>.6309</td>
<td>.4389</td>
<td>.3200</td>
<td>.5876</td>
</tr>
<tr>
<td>Artistic (A)</td>
<td>.2375</td>
<td>.1069</td>
<td>XXXX</td>
<td>.6485</td>
<td>.5740</td>
<td>.6420</td>
</tr>
<tr>
<td>Social (S)</td>
<td>.1159</td>
<td>.0012</td>
<td>.4563</td>
<td>XXXX</td>
<td>.8926</td>
<td>.5787</td>
</tr>
<tr>
<td>Enterprising (E)</td>
<td>.2063</td>
<td>.0899</td>
<td>.3365</td>
<td>.4406</td>
<td>XXXX</td>
<td>.4249</td>
</tr>
<tr>
<td>Conventional (C)</td>
<td>.3140</td>
<td>.0093</td>
<td>.2537</td>
<td>.4695</td>
<td>.4811</td>
<td>XXXX</td>
</tr>
</tbody>
</table>

* These correlations were higher than the criterion group of Pharmacists.

** Criterion Pharmacist group correlations are above the diagonal (XXXX) and Simulation Pharmacist group correlations are below.
TABLE 7

Intercorrelations** for Simulation of Dentists
and the Criterion Group of Dentists

<table>
<thead>
<tr>
<th></th>
<th>R</th>
<th>I</th>
<th>A</th>
<th>S</th>
<th>E</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic (R)</td>
<td>XXXX</td>
<td>.4232</td>
<td>.0034</td>
<td>.2725</td>
<td>.1674</td>
<td>.0518</td>
</tr>
<tr>
<td>Investigative (I)</td>
<td>.3593</td>
<td>XXXX</td>
<td>.2725</td>
<td>.4114</td>
<td>.3705</td>
<td>.1791</td>
</tr>
<tr>
<td>Artistic (A)</td>
<td>.0590*</td>
<td>.1275</td>
<td>XXXX</td>
<td>.5897</td>
<td>.6327</td>
<td>.7661</td>
</tr>
<tr>
<td>Social (S)</td>
<td>.0779</td>
<td>.1609</td>
<td>.4900</td>
<td>XXXX</td>
<td>.8718</td>
<td>.5822</td>
</tr>
<tr>
<td>Enterprising (E)</td>
<td>.1062</td>
<td>.0502</td>
<td>.2602</td>
<td>.5006</td>
<td>XXXX</td>
<td>.5956</td>
</tr>
<tr>
<td>Conventional (C)</td>
<td>.1735*</td>
<td>-.0283</td>
<td>.1324</td>
<td>.2737</td>
<td>.4491</td>
<td>XXXX</td>
</tr>
</tbody>
</table>

*These intercorrelations were higher than the criterion group of Dentists.

**Criterion group of Dentists are above the diagonal (XXXX) and Simulation group of Dentists are below the diagonal.
intercorrelation for the dentist simulation group was .225 with a range 
-.0283 to .5006. The average intercorrelations for the dentist
criterion group was .408 with a range of .0034 to .7661. Table 8
presents the average intercorrelations (for males and females
separately) by occupational groups. The results of this analysis lends
support for hypothesis 1. The simulation intercorrelations fell in the
closed interval between the criterion groups' intercorrelations and the
normative sample intercorrelations.

Sex Differences

HYPOTHESIS 2

Since the occupations selected were "traditionally
male-dominated" occupations, sex differences in
students' perceptions of specified occupations
were expected on the scales of the Self-Directed
Search. In particular,

A. Males will make significantly more accurate
judgments than females on the first letter code
of the Self-Directed Search.

B. Males will make significantly more accurate
judgments than females on the second and third
letter codes of the Self-Directed Search.

C. Even when high point codes are not considered
males will be significantly different from females
on the six scales of the Self-Directed Search.

For the males, 57% percent made accurate judgments and 55% of the
females made accurate judgments about the first letter code of the two
occupations (Pharmacist and Dentist). The chi-square, $X^2(1) = .081; p < .775$, indicated no differences in the two groups. Thus, the
TABLE 8

Average Intercorrelations for Normative Sample, Experimental Sample and the Criterion Sample by Sex and Occupation

<table>
<thead>
<tr>
<th>OCCUPATION</th>
<th>Pharmacists</th>
<th>Dentists</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Normative Sample</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>-.047</td>
<td>-.047</td>
</tr>
<tr>
<td>F</td>
<td>-.029</td>
<td>-.029</td>
</tr>
<tr>
<td><strong>Experimental Sample</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M</td>
<td>.282</td>
<td>.276</td>
</tr>
<tr>
<td>F</td>
<td>.216</td>
<td>.174</td>
</tr>
<tr>
<td><strong>Criterion Sample (Total)</strong></td>
<td>.495</td>
<td>.408</td>
</tr>
</tbody>
</table>
sub-hypothesis that males would make significantly more accurate judgments than females was rejected. Males and females did not differ in the number of accurate judgments they made on the first letter code.

On the second and third letter codes, 29% of the males made accurate judgments and 23% of the females made accurate judgments on the second and third letter codes. The result of the chi-square, $X^2(1) = .936; p < .333$ indicated no differences. Males and females did not differ in the number of accurate judgments they made.

The accuracy scores were based on the three highest scales for these occupations, however, further differences may be found in the mean scores of subjects on the six scales of the SDS. Since the multivariate analysis of variance for the sex X occupation interaction was not significant ($F = .61; p < .7714$), the occupations were pooled across the six scales of the SDS. The results of the multivariate analysis for the main effect of sex ($F = 5.87, p < .0001$) was highly significant. The results suggest that there are differences between the simulation scores of males and females across the six scales. The Social and Realistic scales were highly significant at .0001 and .009 levels, respectively. The Artistic scale was significant at the .02 level. Table 9 summarizes the analysis of variance tests for the two sexes on the six SDS scales.

Table 10 reports the means and standard deviations for the two sexes on the six scales of the Self-Directed Search. On the Social scale, females simulated higher mean scores than males. However, males simulated higher mean scores on the Realistic scale. Table 11 summarizes the rank order of the mean scores for the six scales across
TABLE 9
Summary of F Tests of the Simulation Means on the Six Vocational Scales of the Self-Directed Search Inventory for Males and Females

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>P</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>.009</td>
<td>6.92</td>
</tr>
<tr>
<td>Investigative</td>
<td>.573</td>
<td>.32</td>
</tr>
<tr>
<td>Artistic</td>
<td>.020</td>
<td>5.49</td>
</tr>
<tr>
<td>Social</td>
<td>.0001</td>
<td>16.07</td>
</tr>
<tr>
<td>Enterprising</td>
<td>.423</td>
<td>.64</td>
</tr>
<tr>
<td>Conventional</td>
<td>.270</td>
<td>1.22</td>
</tr>
</tbody>
</table>
TABLE 10
Means and Standard Deviations of Simulation Scores for Males and Females on the Six Vocational Scales of the Self-Directed Search

<table>
<thead>
<tr>
<th>SCALES</th>
<th>Males (N=100)</th>
<th>Females (N=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Realistic</td>
<td>21.27</td>
<td>9.44</td>
</tr>
<tr>
<td>Investigative</td>
<td>34.73</td>
<td>7.60</td>
</tr>
<tr>
<td>Artistic</td>
<td>17.97</td>
<td>8.95</td>
</tr>
<tr>
<td>Social</td>
<td>29.67</td>
<td>6.35</td>
</tr>
<tr>
<td>Enterprising</td>
<td>28.57</td>
<td>8.21</td>
</tr>
<tr>
<td>Conventional</td>
<td>23.42</td>
<td>9.23</td>
</tr>
<tr>
<td>SCALES</td>
<td>Males (N=100)</td>
<td>Females (N=100)</td>
</tr>
<tr>
<td>---------------</td>
<td>--------------</td>
<td>----------------</td>
</tr>
<tr>
<td>Realistic</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Investigative</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Artistic</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Social</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Enterprising</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Conventional</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
On the second and third letter codes, percentages revealed very little differences between the two groups. Whites obtained 29% accurate judgments and Blacks obtained 23% accurate judgments. The results of the chi-square for differences in accuracy scores tended not to support the hypothesis. The chi-square, \( X^2(1) = .936; p < .333 \), indicated no differences. The results show that Whites did not make significantly more accurate judgments on the second and third letter codes than Blacks.

Again, the accuracy scores were based on the three highest codes for each occupation, thus additional differences may exist on the other scales of the Self-Directed Search. Since there were no race X occupation interaction (\( F = .30, p < .9663 \)), the occupations were pooled in the following analyses. The result of the multivariate analysis of variance for differences between mean simulation scores of Blacks and Whites was significant (\( F = 2.50; p < .013 \)). A subsequent univariate analysis of variance revealed significance on the Artistic scale (\( p < .02 \)). Five scales of the SDS were not significant at the .10 level and thus did not discriminate among the group. Table 12 summarizes the univariate analysis of variance test for race on the six scales. Table 13 reports means and standard deviations for the two races on the six scales of the Self-Directed Search. Whites had higher mean scores on the Investigative scale, however, the difference was not significant. On the Artistic scale, Blacks had higher mean scores. Table 14 summarizes the rank order of the mean scores for the six scales across the two races. Holland codes derived from the means presented in Table 13 differ for the races only on the fifth and six position.
the two sexes. Holland's codes from the means presented in Table 10 are the same for males and females in all of the first three positions: ISE.

Race Differences

HYPOTHESIS 3

Since the occupations selected were "traditionally White-dominated" occupations, race differences in student perceptions of specified occupations were expected on the scales of the Self-Directed Search. In particular,

A. Whites will make significantly more accurate judgments than Blacks on the first letter code of the Self-Directed Search.

B. Whites will make significantly more accurate judgments than Blacks on the second and third letter codes of the Self-Directed Search.

C. Even when high point codes are not considered there will be significant differences in the mean vectors for Blacks and Whites on the six scales of the Self-Directed Search.

An examination of the percentages for Whites and Blacks revealed some basic differences on the first letter code of the SDS. Sixty-two percent (62%) of the Whites made accurate judgments while 50% of the Blacks made accurate judgments on the first letter code. The chi-square, $X^2(1) = 2.92; p < .087$, for differences in accuracy score 1 was marginally significant. The results support the hypothesis, thus Whites made significantly more accurate judgments than Blacks on the first letter code of the SDS.
TABLE 12

Summary of F Tests of Simulation Scores on the Six Vocational Scales of the Self-Directed Search Inventory of Blacks and Whites

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>p</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>.314</td>
<td>1.02</td>
</tr>
<tr>
<td>Investigative</td>
<td>.459</td>
<td>.05</td>
</tr>
<tr>
<td>Artistic</td>
<td>.020</td>
<td>4.94</td>
</tr>
<tr>
<td>Social</td>
<td>.617</td>
<td>.25</td>
</tr>
<tr>
<td>Enterprising</td>
<td>.259</td>
<td>1.28</td>
</tr>
<tr>
<td>Conventional</td>
<td>.870</td>
<td>.03</td>
</tr>
</tbody>
</table>
TABLE 13
Means and Standard Deviations of the Simulation Scores of Blacks and Whites on the Six Vocational Scales of the Self-Directed Search

<table>
<thead>
<tr>
<th>SCALES</th>
<th>Blacks (N=100)</th>
<th>Whites (N=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Realistic</td>
<td>18.03</td>
<td>9.27</td>
</tr>
<tr>
<td>Investigative</td>
<td>33.53</td>
<td>9.33</td>
</tr>
<tr>
<td>Artistic</td>
<td>20.48</td>
<td>10.17</td>
</tr>
<tr>
<td>Social</td>
<td>30.80</td>
<td>7.39</td>
</tr>
<tr>
<td>Enterprising</td>
<td>38.69</td>
<td>7.99</td>
</tr>
<tr>
<td>Conventional</td>
<td>23.30</td>
<td>9.22</td>
</tr>
</tbody>
</table>
TABLE 14

Rank Order of the Mean Simulation Scores for the Six Vocational Scales for Blacks and Whites on the Self-Directed Search

<table>
<thead>
<tr>
<th>SCALE</th>
<th>Blacks (N=100)</th>
<th>Whites (N=100)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Investigative</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Artistic</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>Social</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Enterprising</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Conventional</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
In addition to the above hypotheses, several other research questions were considered in this study. The first question, "Are students able to predict the interest patterns of one occupation better than the other?", was tested for both accuracy scores. For ACC1, the group simulating pharmacist predicted the first letter code accurately 64% and the group simulating dentist predicted the first letter code accurately 48% of the time. The result of the chi-square, $X^2(1) = 5.195; p < .023$, for differences in accuracy scores for the two groups on the first letter code revealed some differences. The results show that more subjects accurately predicted the first letter code of pharmacists than dentists. On the second and third letter codes, the group simulating pharmacist predicted the codes accurately 35% of the time and the group simulating dentists predicted the codes accurately 17% of the time. The chi-square, $X^2(1) = 8.42; p < .003$, revealed differences in the two groups. The pharmacist group predicted more accurate judgments than the dentist group.

The second question, "Are there differences in the mean simulation scores on each of the scales of the SDS?", was an attempt to examine the scales that were not necessarily the highest three codes for each group. The multivariate analysis of variance for the main effect of occupations ($F = 10.41; p < .0001$) indicated differences among groups across the scales. Four of six scales were significantly different (not Social and Artistic).
CHAPTER V

DISCUSSION

The present study was designed to test the assumption that students' occupational stereotypes are accurate. Since a major assumption of Holland's theory is that vocational stereotypes have reliable and important psychological and sociological meanings, 200 college freshmen were asked to simulate the interest patterns of two occupational group members selected from Holland's Investigative environment. Simulation was used to measure stereotyping. The Self-Directed Search was the instrument used since it was designed by Holland to operationalize his theory.

Summary

Two randomly selected student groups were asked to take the Self-Directed Search in a manner they thought a specific occupational group member would respond. One student group (N=100) responded as a pharmacist would respond to the SDS and the other student group (N=100) was asked to respond as a dentist would respond to the SDS. The two occupations (Pharmacist and Dentist) were selected from the Occupations Finder's Investigative occupational environment. These occupations were based on research which has shown that high level Investigative occupations are non-traditional for females and Blacks (Gottfredson,
The student groups were divided into groups based on sex and race (See Table 1). This allowed for sex and race comparisons of the data. The students were also asked to respond to a Biographical Data Questionnaire in order to obtain personal information about the subjects.

Additionally, two corresponding occupational groups responded to the Self-Directed Search, a group of Pharmacists (N=20) and a group of Dentists (N=20). The data from these two groups on the Self-Directed Search was used as a criteria against which to measure the accuracy of the students' stereotypic responses as well as to test Holland's theory.

Each subject was assigned two accuracy scores (ACC1 and ACC2). If students were able to accurately predict the first letter code (Investigative) of pharmacists and dentists (ACC1), they were given one accuracy point. Other predictions were not given any points, and thus scored zero. A second accuracy score was also given for second and third letter codes. The order for these two codes were not important. However, students must guess both the second and third letter codes for the two occupations accurately (ACC2) in order to receive an accuracy point.

Findings and Discussion

One way of conceptualizing stereotypes is to see if students responding as themselves were discriminated from the same students simulating their assigned occupational group (Elmendorf, 1972). Since, however, the students in this sample responded to different instruments
for self and for simulation, this conceptualization of stereotype could not be used. Thus, additional data from the normative sample had to be obtained in order to test for stereotypes.

The hypothesis that students' predictions of professionals' profiles will lie in the closed interval between the normative samples' profile and the profile of the criterion group was supported on all the scales of the Self-Directed Search for the pharmacist group. Thus, the experimental group of pharmacists were accurate in their perceptions of the pharmacist group. The dentist group, however, was not as accurate. The dentist simulation mean scores for both males and females fell in the closed interval between the criterion group of dentists and the normative sample means on five scales (not Conventional). For both males and females, the simulation means fell outside the boundaries of the normative and criterion groups. Thus on this scale, both males and females were overstereotyping. The students overemphasized the role of Conventional activities and interests for the dentist group. Thus, it can be concluded that students had misperceptions about role of Conventional interests and activities of dentists.

Additionally, females seem to also underestimate the role of Realistic activities for the dentist group. Eventhough the females simulation scores fell between the normative and criterion group on this scale, the mean score for this scale was significantly different from the criterion group. Thus, females were uncertain about the degree of importance of the Realistic scale. As a result the females used their own positions as "anchors" in judging the interest patterns of the
dentists on this scale. They underestimated the Realistic activities and interest patterns of dentists.

The third part to this hypothesis dealt with the intercorrelations for the six scales of the SDS. The intercorrelations for the simulation scores and the normative sample scores were similar for males and females. Again, it was predicted that the simulation intercorrelations will be intermediate between the normative sample intercorrelations and the criterion groups' intercorrelations. Overall, the intercorrelations supported the hypothesis for both the pharmacist and dentist groups. Thus students simulated intercorrelations were intermediate between the normative sample's intercorrelations and the criterion groups' intercorrelations.

The results of this hypothesis reveals that students do have perceptions about specified occupations (pharmacist and dentist). However, this writer does not think the students hold stereotypes in the sense that Lippmann spoke of stereotypes. The students were able to see the relevance of some scales more than others and when uncertain used their own positions to help make judgment about the relevance of the scales.

Since males were expected to have more information about "male-traditional" occupations, sex differences were expected on the six scale of the SDS. On Accuracy Score 1, the results of the chi-square indicated no differences (p < .775). Males did not make more accurate judgments than females. Thus when subjects were asked to simulate the specified occupations, males did not guess Investigative more than
females. On the second & third letter codes, there were no differences (p < .333). Again, males did not obtain more accurate judgments than females. The analysis shows that both males and females are making more inaccurate judgments than they are accurate judgments. Thus both groups seem to need more information about the interest patterns of specified occupations (pharmacist and dentists).

The accuracy scores (ACC1 and ACC2) were based on the three highest codes for these occupations, thus additional analyses were performed to see if differences existed in the mean simulation scores for males and females. A multivariate analysis of variance for the main effect of sex was highly significant. The results suggest that there were differences between the simulation scores of males and females. The Social and Realistic scales were highly significant at .0001 and .009 levels, respectively. Females simulated higher mean scores on the Social scale and males simulated higher mean scores on the Realistic scale. This can be supported by the difference in masculine and feminine characteristics found in the two scales. Using Helson's theory as a basis for explanation, the two groups (males and females) may have been using their own position as an "anchor" for their judgments. Thus females would rate the Social scale higher because those activities are more appealing to them. They may see the relevance of this scale to pharmacists and dentists, and give more like scores than the males because the activities are appealing to them. The same explanation can apply for the males on the Realistic scale. If males were using their own position as an "anchor", they may give more like responses than
females on this scale.

The Artistic scale was significant at the .02 level with females simulating higher mean scores. Artistic was the low point code for males while Realistic was the low point code for females. The differences being in the low point codes for the two groups (males and females) seem to be additional support for the importance of low point codes in explaining differences in personality. It seems that as both groups move away from the high point codes, the more uncertainty they have about the relevance of certain scales to the specified occupations.

Again, since the occupations selected were non-traditional occupations for Blacks, race differences were expected. Thus, Whites were expected to make more accurate judgments than Blacks. On Accuracy Score 1, some basic differences were found between Blacks and Whites. Whites made significantly more accurate judgments than Blacks. The second accuracy score did not discriminate between Blacks and Whites. Whites did not make more accurate judgments than Blacks.

Overall, when looking at students' ability to predict the initial interests patterns of specified occupations, Whites tend to be able to predict the initial interest patterns better than Blacks (p < .02). As well, this may indicate that Whites have more knowledge about the basic interest patterns of specified occupations (Pharmacists and Dentists). However, when secondary interest patterns are examined, both groups (Blacks and Whites) lack information about the interest patterns. Thus this research tends to support Grotevant & Durrett's (1980) notion that one type of information that students may lack is information about
vocational interest and types of work environments most predominantly associated with occupations. It could be that students have inaccurate information about occupations.

The accuracy score involved only the highest three codes, additional analyses were performed to test race differences in simulation scores. The multivariate analysis of variance test for race differences provided moderate support for the main effect of race ($p < .10$). The Artistic scale was the only significant scale ($p < .02$). The Artistic scale was ranked 5 for Blacks and 6 for Whites.

Additionally, it should be noted that many of the differences in the groups (Blacks and Whites) can be found in the low point codes. Holland has ignored the low point code in determining the individual's personality except when he speaks about homogeneity/heterogeneity. However, it has been found with various other tests (MMPI) that low point codes play an important role in personality. This may also be true of the SDS low point codes. The low point codes seem to suggest a larger rejection of particular activities. As suggested by Parker (1983), additional research is needed on the effect of low point codes on vocational choice and Holland's theory.

**Limitations**

Even though this study has attempted to control for limitations in the design, this study is not without its problems and limitations. One limitation occurs in the basic design. Students were asked to respond to different instruments for themselves than when simulating specified
occupations. Thus analyses for stereotypes were harder to perform and data had to be obtained from the normative sample to make comparisons. A second limitation of the study was the small size of the occupational groups used as a criterion. Also along these lines, controls for sex and race in the criterion group may have revealed some interesting findings. One other sample limitation deals with the selection. The sample was selected and limited to college students. Given the above parameters, generalizations to non-college students or other occupational groups should be made with caution. A third limitation of this study was that both occupations were selected from one occupational environment. It would have been better if occupations could also have been selected from two different environments.

Implications

While the results of the present study should be interpreted cautiously, they do have some implications for both counseling and research. In general, the study have implications for Holland's theory of vocational choice in that it verifies that students do indeed have some accurate perceptions of specified occupational group members. The finding that the stereotypic responses of a random group of college students as measured by the Self-Directed Search have some degree of inaccuracy from the corresponding occupational groups introduces a bit of uncertainty concerning the use of occupational stereotypes as an adequate partial basis for the making of occupational choices by students. Whether students are successful in finding an occupational
environment compatible with their hierarchy of personal orientations, as Holland's theory indicates they search for, may very well be dependent on the accuracy of their stereotypes of the occupations. Thus if these stereotypes are inadequate, as generalizations of the findings from this study would suggest is likely to be the case, the search of the student may entail a number of surprising frustrations. As well, counselors should be aware of the possible effect of sex and race on the accuracy of the stereotypes of college students. This study also introduces an important theory for working with occupational stereotypes.

Several directions for future research are indicated. Additional comparison studies are needed with other occupational environments making comparisons between stereotypic accuracy for traditional and non-traditional occupations for females and Blacks. Insight may be gained by performing comparison studies by age for persons in the actual occupations, to see if age affects interest patterns.

Further research can be performed by actual experimental methods to test the effect of stereotypes on occupational selection. By giving students stereotypes about jobs and then having them to fill-out the SDS, the effects of stereotyping might be directly tested.
APPENDIX A

Instructions
APPENDIX A

My name is Shelia Jeanette Parker and I am a graduate student in Developmental Psychology at The Ohio State University. I am attempting to locate a large number of college freshmen to participate in a research study for my Dissertation. I would like you to participate in a research study that concerns occupational stereotyping. It will involve only a small amount of your time, but I do need you because you are a member of a special group of people.

Holland believes that individuals in our society have stereotypes of various vocations and that these stereotypes are meaningful to the individual. However, little research has been done to explore this assumption. This study will attempt to investigate this assumption.

Participation in this study will involve approximately one hour. There are two short instruments, The Self-Directed Search and a Questionnaire. The Self-Directed Search will
require that you respond "like" or "dislike" to a list of occupations and activities. This instrument will be administered twice. The questionnaire will have biographical data for you to respond.

While your participation will help to substantiate or weaken an entire theory, your participation is voluntary and will be completely confidential. Please do not put your name on any of the inventories. However, you will be assigned a number that you will be asked to place on all the instruments.

If you desire further information about the theory, or the results, enclose a note in your returned package and I will respond.

Thank you for your time and help.

Sincerely,

Shelia J. Parker
INSTRUCTIONS ON HOW TO FILL OUT THE ENCLOSED INSTRUMENTS

The first sheet in this packet is just an introduction. It will tell you who I am and what this research is about. Once you have read that, you may go to the next page which is the consent form. I will need your signature and date on the consent form. You do not have to initial the consent form where it asks you to.

You may notice that the beginning sheet says the experiment is approximately one hour, however, the actual experiment has been lasting approximately 30 to 45 minutes for most students.

The first instrument is called the Self-Directed Search (SDS). The SDS is the yellow instrument. On the front cover of the yellow instrument you will see an occupation. This occupation is the one only you are to fill out the SDS pretending you are. In other words, you are pretend you are a pharmacist or dentist and fill out this instrument the way you think a pharmacist or dentist would fill out this instrument. On page 3 of this instrument you will find occupational daydreams. You only have to fill in three daydreams, and I will do everything after that. In other words, you do not have to code it. To make sure you understand the occupational daydreams, you are to fill in daydreams that you think a pharmacist or dentist will have. Then go to page 4. On page four and throughout the instrument, you will find a statement saying "total no. of L's", please do not fill them in. I will add that up for you. All have have to do is blacken the squares or circle the number. You will continue to page 10 but do not do page 10. Page 10 will be crossed out so you will know where to stop.

When you get to page 10 of this instrument, you will stop. Close the booklet and go to the questionnaire entitled, "Biographical Data Questionnaire". On this questionnaire you will no longer pretend you are a pharmacist, but fill this instrument out for yourself. This
instrument goes from page 1 to 12, however, there is no page 5. Remember you are no longer pretending you are a pharmacist or dentist, but you are filling this instrument out about yourself.

Again, I would like to thank you for agreeing to participate in my research. I would not be able to complete my degree in time if it was not for you. May God Bless you!!

Sincerely,

Shelia J. Parker
The items in this questionnaire ask for information about your personal history. Most questions call for a single answer but some call for more than one. The latter are clearly indicated.
A. Basic Personal Information

1. What is your present age? ____________

2. Are you
   _____ A. Male   _____ B. Female

3. What is your ethnic background?
   _____ A. American Indian or Native Alaskan
   _____ B. Asian or Pacific Islander
   _____ C. Black, non-Hispanic
   _____ D. Hispanic
   _____ E. White, non-Hispanic

4. What is your major? ___________________

5. What was the last grade completed by you (Place an X on the appropriate line):
   _____ 12th grade   _____ College, 2 years
   _____ College, 1 year   _____ College, 3 years

6. How many quarters have you been enrolled at OSU? ____________

7. Have you ever worked part-time?
   _____ A. Yes   _____ B. No

   If yes, Name the occupation you enjoyed most.

   __________________________________________________________

   Name the occupation you enjoyed least.

   __________________________________________________________
8. Have you ever applied for summer or part-time work that you felt might be beneficial, but failed to get it?

______ A. Yes  _______ B. No

9. Earlier when you was asked to simulate an occupation on the Self-Directed Search, did you use a particular person as a model?

______ A. Yes  _______ B. No

If yes, specify the relationship to you.
References


