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The Ohio State University

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THE CONCURRENT VALIDITY OF HOLLAND'S THEORY
FOR COLLEGE-DEGREED MEN AND WOMEN
WORKING IN TRADITIONALLY FEMALE OCCUPATIONS

Dissertation

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

By
Robert E. Huston, B.A., M.A.

* * * * * *

The Ohio State University
1985

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DEDICATION

To my wife, Marilyn Joy, the sunshine of my life. Even if I could have done it without you, it wouldn't have been worth doing.

And to the memory of my father, Harold V. Huston, who taught me the value of hard work and self-sacrifice, and who taught me to never, never quit.
ACKNOWLEDGEMENTS

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To Fred Ruhlen and Nancy Perrin, thanks for service "above and beyond the call of duty" in their statistical consulting. To Dr. Howard Merriman, Robert Godwin, Barbara Plaugher, Mary Weaver, Vicky Hardesty, Ib Thomsen and Burr Pelton—special thanks for facilitating the process of data collection. To numerous family members and friends--Mom, Vance, Elaine, Vince, Victor, Dad Ransom, Olive, John and Jackie, Judy, Vicky, and others--very special thanks for acts of encouragement and support too numerous to mention.

And—saving the best till last—my gratitude to Marilyn is beyond words. No one can ever fully appreciate the depth of love and devotion she has shown since first leaving family and friends to stand beside me in pursuit of my career goals. Her very skillful typing of this manuscript is just a small sample of all she has done, all she has endured, all she has sacrificed, in order to give me her faithful support. I can never repay her, but I will try.
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CHAPTER I

INTRODUCTION

The Nature and Purpose of Vocational Guidance

Since the time of its founding by Frank Parsons in 1908, "vocational guidance" has had the potential to be one of the helping professions' more significant contributions to human well being. According to John Holland (1973), some changes have occurred since 1908, but much is still the same:

The goal of vocational guidance—matching men and jobs—remains the same despite much talk, research, and speculation. Our devices, techniques, classifications, and theories are more comprehensive and sophisticated than in the days of Parsons (1909), the founder of vocational guidance, but the goal is still one of helping people find jobs that they can do well and that are fulfilling.

Perhaps the only radical shift in point of view is the belief that it is valuable to see the processes of vocational decisions (vocational choice, choice of training, and work history) in the context of a person's development. This view has led to more activities planned to improve the quality of a person's decision-making and knowledge of self and the occupational world, but the main test of this reorientation also lies in a more felicitious accommodation of men and jobs. (p. 85, italics mine)

Holland goes on to decry the fact that most vocational guidance programs have not kept pace with advances in research and theory but have instead remained "a hodgepodge of pragmatic, atheoretical practices and devices" (p. 86, italics mine). Other authors (e.g. Osipow, 1973, 1983; Morrill and Forrest, 1970) have raised similar criticisms of vocational guidance practices, declaring that vocational counselors should not merely match clients with jobs in the Parsonian tradition but should
assist clients in developing the skills and understandings necessary for guiding themselves through a life-long process of career development (i.e. personal development) in a changing world.

Thus, it is argued, career development interventions must be sophisticated enough and flexible enough to address the full range of career process/personal development issues: not only the development of vocational preferences, the making of vocational choices, and the attainment of particular occupations (Vroom, 1964), but also changes in occupations or vocations and the maximizing of personal satisfaction and vocational achievement.

### The Role of Theory in Vocational Guidance

Why has there been a gap between theory and practice in vocational psychology? Why has vocational counseling tended to remain a hodgepodge of Parsonian ideas and techniques? Osipow (1973) suggests that "one probable reason . . . is that often no systematic study or research has been made," and furthermore that "it is highly likely that the lack of research has resulted from a scarcity of systematic thinking about career development" (p. 7).

That is, for counseling practice to be sound, it should be based upon empirically validated theory. A good theory stimulates research and provides a basis for improvement in practice (Morrill and Forrest, 1970; Osipow, 1983).

### A Useful Theory of Careers

In vocational psychology, one theory that is expected to continue to "exert an influence on research in career choice for some time and to
have a growing impact on counseling itself" (Osipow, 1983, p. 113) is Holland's (1966, 1973, 1985) career typology theory. Holland (1985) presents his theory as having a developmental (career process) emphasis, dealing with "vocational problems throughout a person's life: vocational choice, work history, job changes, and occupational achievement" (p. x). In Chapter Six of his 1973 work, Holland builds a convincing case for the claim that

The present theory, with its occupational classification and related instruments, offers many practical applications for vocational guidance. The theory and its instruments can be used to (1) organize occupational information in simple, clear-cut, usable terms; (2) explain and interpret both vocational data and vocational behavior; and (3) provide specific formulations to facilitate vocational development and help those people whose vocational development has gone awry. (p. 86)

Various reviewers (Campbell, 1974; Holland, Magoon, & Spokane, 1981; Osipow, 1976, 1983; Walsh, 1973; Zytowski, 1978) agree that the basic tenets of the theory in its present form have withstood the test of empirical validation rather well.

Background and Origins of Holland's Theory

Holland's theory is a creative synthesis of several sources of influence on his thinking: the vocational literature, his experience as a vocational counselor, and his early empirical work with the Vocational Preference Inventory (VPI) (Holland, 1958). These three strands of influence converged in the formulation of one central idea: that it is useful to categorize people in terms of interest or personality types.

Holland (1985) recounts the process of distilling the ideas for his career typology theory as follows. In his professional work
Holland observed that most human interests, traits and behaviors tend to fall into several broad categories— as, for example, Darley (1938) found in his analysis of "primary interest patterns" among University of Minnesota students taking the 1936 Strong: men with particular primary interest patterns tended to have corresponding personality profiles (as measured by other tests), and these personality patterns were consistent with common occupational stereotypes (e.g. the aggressive salesman, the meek bookkeeper). This suggested to Darley that there are "occupational interest types" with identifiable "personality characteristics that would seem to be developmentally determined" (p. 473, italics mine).

In his own effort to operationally define these types, Holland (1958) developed the VPI, with six scales corresponding to the present six types: Motoric (Realistic), Intellectual (Investigative), Supportive (Social), Conforming (Conventional), Persuasive (Enterprising), Esthetic (Artistic). Interestingly, these six types closely parallel the six major factors in human interest found earlier by Guilford, Christensen, Bond, and Sutton (1954): mechanical, scientific, social welfare, clerical, business, and aesthetic.

Another idea which is central to Holland's theory is that environments can be characterized according to the same six categories (Realistic, Investigative, etc.), largely because of the influence of the persons composing them. Holland extrapolated this notion from Linton's (1945) treatise on the interrelatedness of personality psychology and cultural anthropology, in which he spoke of the "social component" of "human stimulus situations" (p. 90 ff). Holland's Environmental Assessment Technique (EAT) (Astin and Holland, 1961),
which involves assessing an environment by calculating its distribution of types, was developed as a means for operationalizing this concept.

Finally, the now-familiar notion that an individual's behavior is a function of the interaction between the person and the environment (Lewin, 1936) also has a place in Holland's theory. Holland borrowed most directly from Murray's (1938) need-press formulation of this idea in building into his own theory "the assumption that human behavior depends upon both personality and the specific environment in which a person lives" (Holland, 1985, p. 6).

Some additional ideas in Holland's theory that parallel or complement the work of other theorists and researchers are enumerated below (adapted from Holland, 1985, pp. 7 - 11).

1. Vocational interests and vocational choices are expressions of personality; therefore, interest inventories are personality inventories. Bordin (1943) espoused the view that "interest patterns may be considered to be by-products of the individual's personality" (p. 54) and that scores on interest inventories are measures of self-concepts. Darley and Hagenah (1955) took a similar view. Super (1972) built a formidable theory around the idea that vocational choice is a developmental process involving the implementation of one's self-concept. Forer (1948, 1951) did some pioneering work in using interest inventories to investigate various aspects of patients' personalities. This latter work was a direct antecedent of Holland's (1958) development of the VPI, a personality inventory consisting solely of "interest" inventory items (occupational titles), based on the assumption that occupational preferences are expressions
of one's personality, i.e. that in stating occupational preferences, one is revealing information about his "motivation, his knowledge of the occupation in question, his insight and understanding of himself, and his abilities" (Holland, 1978, pp. 5 - 6).

2. Vocational stereotypes are reliable and serve an important purpose. Vocational preferences, and inventories like the VPI designed to measure them, rest upon the assumption that people perceive occupations similarly and accurately and that these perceptions (plumbers are handy, lawyers are aggressive, etc.) do not change with time. Research support for this assumption can be found in the work of O'Dowd and Beardslee (1960, 1967) and Marks and Webb (1969). O'Dowd and Beardslee surveyed high school students and college freshmen, seniors and faculty and found "great agreement among groups . . . on the characteristics of occupations" (1960, p. 119), regardless of demographics of the groups (e.g. sex, socioeconomic status, family occupational setting). Marks and Webb assessed the "occupational image" of industrial manager or electrical engineer held by freshmen and seniors preparing for each of those occupations and postgraduates employed in the occupation. They found that "the three groups varying in professional experience share a common 'image' of the typical occupational incumbent" (p. 292).

3. The members of a vocation have similar personalities and similar histories. This assumption is also of central importance in Anne Roe's (1956, 1957) well-known theory, and other researchers have presented evidence that supports it. Within the field of engineering, for example, Kulberg and Owens (1960) and Chaney and Owens (1964) have shown that life history data are helpful in predicting
the development of interest in engineering and in its two most
dissimilar branches, research and sales.

Nachmann (1960) conducted a rather elaborate study in which
clinical interviews were used to collect information about the child­
hood experiences of graduate students in law, dentistry and social
work. Thirteen hypotheses based in psychoanalytic theory were test­
ed and most were supported by the data. For example, the dentist
(characterized in this study as exercising absolute authority over
patients while performing "manifestly aggressive" acts without con­
sciously aggressive intent) was found to have had a childhood in­
volving a strong, dominant father, repression of aggressive im­
pulses, harsh discipline with emphasis on arbitrary obedience to
authority, encouragement of physical skills (moreso than verbal and
intellectual skills), and awareness of a parent's or sibling's se­
vere illness involving internal organs.

4. Because people in a vocational group have similar personal­
ities, they will respond to many situations and problems in similar
ways, and they will create characteristic interpersonal environments.

Indirect support for this assumption can be found in the work of
Astin and Holland (1961), who utilized the EAT to demonstrate that
"the press characteristics . . . of a particular school can be pre­
dicted with modest success simply from a knowledge of the students' 
number, average intelligence, and distribution of major fields" (pp.
315 - 316). Further indirect support is provided by Astin's (1968)
study of the relative importance of 275 environmental stimuli at
246 colleges and Richards, Seligman and Jones' (1970) analysis of the
faculties and curricula at 142 colleges.
5. Vocational satisfaction, stability, and achievement depend largely on the congruence between one's personality and the environment in which one works, i.e. we are more likely to perform well in an occupation where we "fit" psychologically. A vocational environment is fitting or congruent for a given person if it "is one in which a person's preferred activities and special competencies are required, and his or her personal disposition and its associated characteristics ... are reinforced" (Holland, 1985, p. 11). This kind of assumption has, of course, permeated the vocational literature for some time, most notably in the field of interest measurement.

The foregoing has been a synopsis of the background and origins of Holland's theory. The essentials of the theory in its present form are reviewed below.

Essentials of Holland's Theory

Holland's theory of careers (Holland, 1966, 1973, 1985; Holland & Gottfredson, 1976) basically consists of three ideas, the assumptions upon which they are based, and the implications that follow from them. These ideas are as follows. (1) People tend to resemble, in varying degrees, each of six personality types: Realistic, Investigative, Artistic, Social, Enterprising, Conventional. (2) The environments in which people live and work likewise resemble, in varying degrees, six model environments: Realistic, Investigative, Artistic, Social, Enterprising, Conventional. (3) The interaction of persons and environments results in predictable and understandable outcomes in such areas as educational choice, stability and achievement;
vocational choice, stability and achievement; personal development and effectiveness; social behavior; and responsiveness to the environment.

These ideas are elaborated in four working assumptions that make up the core of the theory (Holland, 1985): 1. In our culture, most persons can be characterized as one of six types: Realistic, Investigative, Artistic, Social, Enterprising, or Conventional. A type is a theoretical model against which the characteristics of a real person may be measured, to determine which type (s)he most resembles. The person's overall relative degree of resemblance or lack of resemblance to each of the six types is referred to as his personality pattern, of which there are 720 different possibilities. These can be identified by six-letter codes representing decreasing order of resemblance, e.g. RICEAS (a Realistic type who most resembles an Investigative type and least resembles a Social type), although the usual practice is to represent personality patterns by two- or three-letter high point codes.

Thus, profile scores from the Vocational Preference Inventory (Holland, 1977), the Self-Directed Search (Holland, 1977), or the Strong-Campbell Interest Inventory (Strong & Campbell, 1974) are measures of one's personality pattern or personal orientation. One's personal orientation is assumed to be the product of a life-long and ongoing process, wherein experience helps to shape interests and competencies that predispose a person to think, perceive and behave in characteristic ways that more or less resemble any one of the six pure types.
2. There are six kinds of environments, corresponding to the six personality types: Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. An environment is a reflection of the people in it, so that an environment dominated by Realistic types would be a Realistic environment, reflecting the interests, competencies and dispositions of the people who constitute it. Likewise, an environment dominated by Social types would be a Social environment, etc. One method, then, for assessing an environment is to count the number of different types within it and code it accordingly, with the arrangement of the six letters ranging from the highest to the lowest percentages represented.

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. That is, Realistic types search for and are attracted by Realistic environments, Social types search for and attracted by Social environments, etc. This is an ongoing process that manifests itself in a variety of ways.

4. A person's behavior is determined by an interaction between his personality and the characteristics of his environment. Knowledge of a person's personality pattern and knowledge of the pattern of his environment should enable us to better predict the outcomes that will result: educational and vocational choices, changes and achievements; personal competence; and social behavior.

The six personality types have been characterized in some detail in Holland's most recent formulations (1978, 1985) as follows:
Realistic. The Realistic person prefers "activities that entail the explicit, ordered, or systematic manipulation of objects, tools, machines, and animals" (1985, p. 19). While avoiding social (educational and therapeutic) activities, Realistic types are inclined to develop manual, mechanical, agricultural, electrical, and technical competencies. They see themselves as having mechanical and athletic ability; they value concrete things or tangible personal characteristics (e.g. money, power, status); and they present themselves as being asocial, frank, masculine, normal, practical, and uninsightful. With these characteristics, the Realistic person is inclined toward such occupations as carpenter, drill press operator, shipping/receiving clerk, surveyor, and office machine serviceman.

Investigative. The Investigative person prefers "activities that entail the observational, symbolic, systematic, and creative investigation of physical, biological, and cultural phenomena in order to understand and control such phenomena" (1985, pp. 19-20). While avoiding enterprising (persuasive) activities, Investigative types are inclined to develop scientific and mathematical competencies. They see themselves as scholarly, intellectually self-confident, and having mathematical and scientific ability; they value science; and they present themselves as being analytical, curious, independent, intellectual, methodical, precise, and shy. With these characteristics, the Investigative person is inclined toward such occupations as anthropologist, physicist, geologist, and surgeon.
Artistic. The Artistic person prefers "ambiguous, free, un-systematized activities that entail the manipulation of physical, verbal, or human materials to create art forms or products" (1985, p. 20). While avoiding conventional (explicit, systematic, ordered) activities, Artistic types are inclined to develop competencies in language, art, music, drama, and writing. They see themselves as expressive, original, intuitive, feminine, nonconforming, introspective, independent, disorderly, and having artistic and musical ability; they value esthetic qualities; and they present themselves as being expressive, feminine, idealistic, imaginative, introspective, original, and unconventional. With these characteristics, the Artistic person is inclined toward such occupations as philosopher, teacher of the arts, writer, actor-actress, and interior decorator.

Social. The Social person prefers "activities that entail the manipulation of others to inform, train, develop, cure, or enlighten" (1985, p. 21). While avoiding realistic activities (involving materials, tools or machines) Social types are inclined to develop interpersonal and educational competencies. They see themselves as liking to help others, understanding of others, and having teaching ability; they value social and ethical activities and problems; and they present themselves as being ascendant, cooperative, feminine, generous, helpful, kind, responsible, sociable, and understanding. With these characteristics, the Social person is inclined toward such occupations as counselor, foreign service officer, home economist, and speech teacher.
Enterprising. The enterprising person prefers "activities that entail the manipulation of others to attain organizational goals or economic gain" (1985, p. 21). While avoiding investigative (observational, symbolic and systematic) activities, Enterprising types are inclined to develop leadership, interpersonal and persuasive competencies. They see themselves as aggressive, popular, self-confident, sociable, and possessing leadership and speaking abilities; they value political and economic achievement; and they present themselves as being adventurous, ambitious, dependent, dominant, enthusiastic, flirtatious, impulsive, pleasure-seeking, and sociable. With these characteristics, the Enterprising person is inclined toward such occupations as insurance underwriter, buyer, principal, manager, and salesperson.

Conventional. The Conventional person prefers "activities that entail the explicit, ordered, systematic manipulation of data . . . to attain organizational or economic goals" (1985, p. 22). While avoiding artistic (ambiguous, free, exploratory or unsystematized) activities, Conventional types are inclined to develop clerical, computational, and business system competencies. They see themselves as conforming, orderly, and having clerical and numerical ability; they value business and economic achievement; and they present themselves as being conscientious, dependent, efficient, persistent, and practical. With these characteristics, the Conventional person is inclined toward such occupations as mail clerk, data processing worker, accountant, and key punch operator.
A same-named model environment corresponds to each of the above personality types. The Realistic environment, for example, is thought to be "characterized by the dominance of environmental demands and opportunities that entail the explicit, ordered, or systematic manipulation of objects, tools, machines, and animals, and by a population dominated by realistic types" (1985, p. 36). This environment, then, is characterized by an atmosphere that encourages people to (a) perform activities like using machines and tools and to develop competencies and achieve in technical areas, (b) see themselves as having ability in those areas and lacking ability in human relations, and (c) see the world in simple, tangible, traditional terms and value money, power and possessions.

People in a Realistic environment acquire, or are reinforced in, the traits of Realistic types (noted above). Furthermore, they become (1985, p. 37):

1. More susceptible to pragmatic and traditional influences.

2. More attracted to realistic occupations and roles in which they can express themselves in realistic activities.

3. Less adept at coping with others. They have instead simple, direct natural coping methods and repertoires.

As is apparent from the above discussion, a key feature of Holland's theory is its treatment of the interplay between a person and his/her environment: educational, vocational and social behaviors are products of an interaction between the person and the environment. Holland (1985) utilizes the concepts of consistency, differentiation¹, identity and congruence to describe the nature of

¹Originally referred to as homogeneity
the interactions between and within persons and environments.

The hexagonal model reproduced here as Figure 1 (Holland, 1985), is useful in visualizing the concepts of consistency and congruence. The hexagon depicts intercorrelations for VPI scale scores from two large samples of two- and four-year college students tested in the late 1960's (Holland, Whitney, Cole, & Richards, 1969).

**FIGURE 1**

THE HEXAGON: A MODEL FOR DEPICTING THE RELATEDNESS OF TYPES AND ENVIRONMENTS

Note that the distance between any two points (scales, types) on the hexagon is a representation of the degree of relatedness of those two types (e.g. E most closely resembles C and S, resembles R and A less and I least of all).

Consistency. A personality pattern or an environment "is consistent if its related elements have common characteristics" (1985, p. 26). Thus, a pattern represented by the high point code CE is more consistent than the pattern represented as CA. The correlations between these scales (.68 and .11) portray the fact that Conventional
and Enterprising have several characteristics in common (persistent, valuing economic achievement, etc.), whereas Conventional and Artistic have very little in common. Likewise, SAI is a more consistent code than IEC.

Thus, the hexagonal model can be used to assess (1) the degree of consistency within a person's personality pattern, (2) the degree of consistency within an environment, and (3) the degree of consistency between a person and an environment.

**Differentiation** (homogeneity). The degree of differentiation refers to how clearly defined a person or environment is. Examples of the two possible extremes would be a person who resembles one type and no other (a well differentiated profile) and a person who resembles each type equally (a poorly differentiated, "flat" profile). Differentiation is represented numerically as the absolute difference between the highest and lowest value in a six-letter code.

**Identity.** Identity is a new construct, added to the theory in its 1985 formulation to enhance its ability to explain variations between and within persons and environments. For individuals, the degree of identity refers to the degree of clarity and stability of a person's goals, interests and talents. This is assessed by the Identity Scale in Holland, Daiger and Power's (1980) *My Vocational Situation*, in which high scores are associated with having relatively few occupational goals within relatively few main categories. For organizations, the degree of identity refers to the degree of clarity, integration and stability over time of an environment's goals, tasks and rewards. This concept is operationalized as the inverse of the number of an environment's behavior settings (Baker, 1968), i.e. 4n
organization with few occupations or levels within occupations would have a higher identity than an organization with many occupations or occupational levels.

**Congruence** refers to the degree of fit between a person and an environment. Each type is most likely to flourish in its corresponding environment. For example, a Conventional person in a Conventional environment is in a congruent situation. (The environment is providing appropriate opportunities and rewards.) The most incongruent situation for a Conventional person would be to be in an Artistic environment, and several intermediate degrees of congruence-incongruence could be defined by referring to the hexagon.

There can be, of course, many possible kinds of interactions between person and environments, involving various levels of identity, consistency, differentiation and congruence. However, the general hypothesis is that higher levels of identity, consistency, differentiation and congruence are associated with more positive outcomes: greater predictability of vocational choice, greater vocational and personal stability, greater vocational achievement, and greater vocational and personal satisfaction.

**Evaluation of Holland's Theory**

Gottfredson (1983) lists three criteria for evaluating the strengths and weaknesses of a theory: comprehensiveness (content value), accurancy (truth value), and clarity (form). Osipow (1983) has identified six such criteria: explanatory adequacy, empirical support, generality, parsimony, operational adequacy, and logical
consistency. Evaluated by either set of criteria, Holland's theory receives high marks.

Osipow (1976, 1983) finds Holland's theory to be high in clarity and applicability. Simple in its conception compared to most theories, it is relatively easy to make operational. Holland has devoted considerable attention to developing psychometrically sound instruments for operationalizing his constructs. And for all of these reasons, the theory has generated much research, resulting in substantial empirical support.

Although the theory continues to be faulted for suffering from the same limitations as the trait-factor approach and for not adequately addressing developmental issues (Osipow, 1983; Vondracek, Lerner & Schulenberg, 1983), it also continues to be one of the "perennial performers in the field," accounting for "a major portion of the research activity" in vocational psychology (Betz, 1977, p. 134), research that is "broad, varied, and comprehensive" (Osipow, 1983, p. 112).

Most of the early research on Holland's theory, including many of the studies cited in this chapter, used only students as subjects, a fact which prompted Holland (1966a) to observe that "more confidence could be placed in the classification if we had used employed adults" in the samples (p. 287). Almost a decade later Warnath (1974) had grounds to remark that "virtually all of the research evidence for the usefulness of Holland's framework appears to be based on studies of males . . . in higher education" (p. 338).

In the meantime, however, a new research trend had begun: assessing the utility of Holland's theoretical formulations in the wider context of the "real world," sampling from such populations as
various categories of employed adults, women, ethnic minorities, and even the unemployed (Laufer, 1981) and the imprisoned (Weiser, Klimek, & Hodinko, 1981). By the late 1970's and early 1980's, this trend was well established. For example, when Walsh (1979) reviewed the literature of 1978 and called for more research with employed adults, he also noted that seven of the eight studies of employed adults published that year dealt with Holland's theory.

Various reviewers, then, concur that the last two decades' flood of research has provided "generalized support for the overall validity of the theory's constructs" (Osipow, 1976, p. 137), most especially the congruence construct (Holland et al, 1981; Zytowski, 1978). And the last decade's tests of the theory with employed adults have begun to show that it has at least moderate levels of validity for a variety of occupational groups: clergymen, Navy personnel, graduate students, men without college degrees, authors and critics, business school graduates, nonprofessional workers, enterprising workers, women (Osipow, 1983); Blacks (O'Brien & Walsh, 1976; Walsh, Bingham, Horton & Spokane, 1979; Ward & Walsh, 1981); teachers (Wiggins, 1982); police officers (Johnson & Hogan, 1981); counselors (Wiggins & Weslander, 1979); accountants (Aranya, Barak, & Amernic, 1981); female nurses (Hener & Meir, 1981); Investigative types (O'Neil, Magoon & Tracey, 1978); engineers (Meir & Erez, 1981); entrepreneurs (Scanlon, 1980); and women in traditionally male occupations (Benninger & Walsh, 1980; Doty & Betz, 1979; Walsh, Horton & Gaffey, 1977).
Conspicuously absent from the above list is any mention of a study assessing the validity of Holland's theory for men employed in traditionally female occupations (e.g., nursing or elementary education). This is reflective of the vocational literature in general. While "much of the research continues the recent [necessary and important] trend toward exploring sex differences in vocational development and choice" (Bartol, 1981, p. 126), it is unfortunate that "the all-too-frequent practice of studying only women [limits] the applicability of the data" (Fretz & Leong, 1982, p. 129).

The need for research pertinent to nontraditionality among men has been alluded to before (e.g., Fitzgerald, 1980), but there is little such research in the literature (Aldag & Christensen, 1967; Hansen, 1978; Hecht, 1980; Hurd & Allred, 1978; Kadushin, 1976; Lee & Wolinsky, 1973; Lemkau, 1984; Robinson & Canaday, 1978, Wertheim, Widom & Wortzel, 1978.) The handful of studies that have been done are of limited scope; only one of these (Hecht, 1980) directly involved Holland's theory, and Hecht's sample consisted solely of student nurses whose work histories were not specified.

There is a need, then, for investigations that will extend the work on the validity of Holland's theory into the realm of nontraditional occupations for men. The present research project will have such a goal in mind: the investigator proposes to study the concurrent validity of Holland's theory for employed men (and women) working in traditionally female occupations.
CHAPTER II

REVIEW OF THE LITERATURE

Holland's model has been deemed "one of the most thoroughly re- searched classification schemes in all of applied psychology" (Eberhart & Muchinsky, 1984, p. 174). It has stimulated, to date, approximately 400 published articles. Given the vastness of the literature on Holland's theory--not to mention the vastness of the literature on sex roles and traditionality/nontraditionality (Fitzgerald & Betz, 1983, cite 400 references)--the following review must, of necessity, be selective. In an effort to focus on the literature most directly pertinent to the present study, the material to be reviewed has been divided into five sections, as follows.

The first four sections will be devoted to research that has utilized Holland's instrumentation to assess the applicability of his model to employed adults: (1) studies of employed men (16 articles); (2) studies of employed women (10 articles); (3) studies of employed men and women (mixed samples) (13 articles); and of particular interest, (4) studies involving comparisons between employed women and employed men (5 articles). Finally, a fifth section will summarize some especially pertinent articles drawn from the large body of literature dealing with sex as a variable in vocational choice and career development (6 studies of nontraditional vocational choice). The latter two sections will contain the material most directly pertinent to the present investigation.

21
Research With Employed Men

A. Studies of College-Degreed Men

Since the late 1960's, approximately 16 studies have been conducted bearing directly upon the concurrent validity of Holland's theory for employed men. Among the first of these was Osipow's (1970) pioneering study of clergymen and their work roles. Osipow administered the VPI and a work role checklist (keyed to Holland's typology) to students from two Ohio seminaries, faculty members from the same seminaries, and a random sample of practicing clergymen from the same state. On the six typological scales of the VPI, all five groups scored highest on the Social scale and second or third highest on the Artistic and Intellectual scales—which is consistent with Holland's (1970, 1977a) SAI coding of the occupation, although it is at variance with the report of more than 50% of the practicing ministers, that Conventional work roles occupied most of their time.

In an ambitious study that established a pattern for much research to follow, Lacey (1971) investigated the concurrent validity of Holland's theory by administering the VPI to 230 executive- and professional-level men who had been employed for at least 10 years in eight occupations representing each of Holland's six personal orientations. Realistic—project engineers; Intellectual—research chemists and computer programmers; Social—high school teachers; Conventional—actuaries; Enterprising—bank executives and insurance company executives; Artistic—English and music professors.

Analysis of variance revealed that all but one of the vocational scales (Realistic) successfully differentiated the eight occupational
groups ($p < .01$). A closer look at the data, using the Tukey (b) test, revealed that those five scales, as well as the Masculinity and Status scales, differentiated the occupational groups in ways that were generally consistent with Holland's theory. For example, the Conventional scale differentiated actuaries from computer programmers, high school teachers, English/music professors, and engineers at the .01 significance level.

Finally, most occupational groups had their highest mean scores on the appropriate scales: chemists on Intellectual, high school teachers on Social, bank executives on Enterprising, English/music professors on Artistic, computer programmers on Intellectual. On the other hand, engineers scored highest on Intellectual and second highest on the expected scale (Realistic); insurance executives scored highest on Intellectual, second highest on Enterprising; and actuaries scored higher on Intellectual and Enterprising than on Conventional (although, as noted above, they scored higher on Conventional than most other groups). Thus, Lacey concluded that five of the six scales designed by Holland to measure the vocational types distributed eight occupational groups in a manner consistent with the theory, thereby lending support to the concurrent validity of the VPI and Holland's theory.

In a study with a similar design, Gaffey and Walsh (1974) administered the VPI, SDS, and the Holland Scales (Set I and Set II) developed by Campbell and Holland (1972) to 153 male workers, most but not all of whom had college degrees, Industrial engineers were selected to represent the Realistic type; medical doctors represented Investigative; ministers, Social; morticians, Conventional; insurance and real estate
salesmen, Enterprising; artists and art teachers, Artistic. All subjects had at least one year of experience in their occupation, with a mean of 10.65 years for the total sample.

The results were generally supportive of the concurrent validity of Holland's theory and the concurrent validity of the four instruments. Five scales of the VPI, five scales of both the Holland sets and four scales of the SDS differentiated the occupational groups in accordance with the theory. The test for the main effect of groups was found to be significant for five VPI scales, six SDS scales, six Set I scales and six Set II scales, with occupational groups usually scoring highest or second highest on the appropriate scale (e.g. salesmen on Enterprising) and that scale effectively differentiating that occupational group from several other groups. Finally, the correlations of same-named scales across all four inventories were uniformly high, with 35 of the 36 coefficients ranging between .51 and .94 and all 36 found to be significant.

The remainder of the research with college-degreed working men also tends to support the concurrent validity of Holland's theory. Salomone (1968), for example, found that most of the rehabilitation counselors tested with the VPI in his nation-wide sample were Social types. Gilbride (1973) administered the VPI to 50 active Catholic priests and 50 former priests who had resigned from the clergy. He found that both groups had consistent Social-Artistic two-digit codes, in keeping with the theory, and furthermore, that 80% of the resigned priests had moved to Social-type occupations, such as counseling or social work.

In another study of clergymen, Schuldt and Stahmann (1971) administered the VPI to 55 Methodist pastors and found precisely the same ordering
of types postulated by Holland: SAIERC. In a follow-up study, Fabry (1975) found this same ordering in a heterogeneous sample of 30 ministers from several different denominations.

In a study of the SDS's predictive validity, O'Neil, Magoon and Tracey (1978) sent a follow-up questionnaire to 95 Investigative-type men who had completed the SDS seven years before as college freshmen. They found that the SDS had moderately high efficiency in predicting Ss' actual job entry, graduate major, ideal career plan, and projected career plan.

Finally, the Israeli team of Erez and Shneorson (1980) administered the VPI to a group of academic faculty members in Haifa and a group of industry professionals employed in the same vicinity in engineering and the "management sciences." From the data reported, the following three-digit codes would seem to best represent the four occupational groups: management science (academics--A/IS; industry professionals--IEC), engineering (academics--IAR; industry professionals--ISR). (This diversity of codes illustrates one of the authors' main findings: that personality types and motivational characteristics may vary within a broad occupational category.)

Only one of these four groups, industrial engineers, is directly comparable to any of the occupational categories listed in Holland's (1977a) classification system. Holland presently codes industrial engineers as ERI (and other engineers as IRE). Given the above ambiguities and small Ns used in this study (21 to 25 per cell) Erez and Shneorson's finding, that industrial engineers in Israel score relatively
### TABLE 1
VALIDITY STUDIES WITH WORKING MEN: SUMMARY OF RESULTS

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Valid SDS Scales</th>
<th>Valid VPI Scales</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>College-Degreed Samples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Osipow, 1970</td>
<td>Clergy</td>
<td>NA</td>
<td>*<strong>S</strong></td>
<td>Mixed</td>
</tr>
<tr>
<td>Lacey, 1971</td>
<td>Professionals</td>
<td>NA</td>
<td>IASEC</td>
<td>Positive</td>
</tr>
<tr>
<td>Gaffey &amp; Walsh, 1974</td>
<td>Professionals</td>
<td>RASE_</td>
<td>IASEC</td>
<td>Positive</td>
</tr>
<tr>
<td>Salomone, 1968</td>
<td>Rehabilitation counselors</td>
<td>NA</td>
<td>*<strong>S</strong></td>
<td>Positive</td>
</tr>
<tr>
<td>Gilbride, 1973</td>
<td>Priests</td>
<td>NA</td>
<td>*<strong>S</strong></td>
<td>Positive</td>
</tr>
<tr>
<td>Schuldtt &amp; Stahmann, 1971</td>
<td>Methodist pastors</td>
<td>NA</td>
<td>*<strong>S</strong></td>
<td>Positive</td>
</tr>
<tr>
<td>Fabry, 1975</td>
<td>Ministers</td>
<td>NA</td>
<td>*<strong>S</strong></td>
<td>Positive</td>
</tr>
<tr>
<td>O'Neil et al, 1978</td>
<td>Investigative types</td>
<td><em>I</em>**</td>
<td>NA</td>
<td>Positive</td>
</tr>
<tr>
<td>Erez &amp; Shneorson, 1980</td>
<td>Industry professionals</td>
<td>NA</td>
<td>RI**_</td>
<td>Mixed</td>
</tr>
<tr>
<td><strong>Non-College-Degreed Samples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Morrison &amp; Arnold, 1974</td>
<td>Skilled &amp; semiskilled workers</td>
<td>NA</td>
<td>NA</td>
<td>Mixed</td>
</tr>
<tr>
<td>Andrews, 1975</td>
<td>Upwardly mobile workers</td>
<td>NA</td>
<td>NA</td>
<td>Positive</td>
</tr>
<tr>
<td>Fishburne &amp; Walsh, 1976</td>
<td>Skilled &amp; semiskilled workers</td>
<td>RIAS_C</td>
<td>R_A_C</td>
<td>Mixed</td>
</tr>
<tr>
<td>O'Brien &amp; Walsh, 1976</td>
<td>Skilled &amp; semiskilled blacks</td>
<td>RIASEC</td>
<td>RIASEC</td>
<td>Positive</td>
</tr>
</tbody>
</table>
### Table 1 (Continued)

**Validity Studies with Working Men: Summary of Results**

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Valid SDS Scales</th>
<th>Valid VPI Scales</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mixed-Level Samples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hughes, 1972</td>
<td>National Guardsmen</td>
<td>NA</td>
<td>R_A___</td>
<td>Mixed</td>
</tr>
<tr>
<td>Scanlan, 1980</td>
<td>Entrepreneurs</td>
<td>NA</td>
<td><strong>E</strong></td>
<td>Positive</td>
</tr>
<tr>
<td>Melamed &amp; Meir, 1981</td>
<td>Six types, high &amp; low levels</td>
<td>NA</td>
<td>NA</td>
<td>Positive</td>
</tr>
</tbody>
</table>

*= Scale occupying this position (in RIASEC ordering) was not tested.
_= Scale tested, validity not well supported ("valid" = scale identified appropriate group and/or appropriate group scored highest on that scale).
high on I and R, offers some tentative, albeit weak, support for the concurrent validity of Holland's theory in a cross-cultural context.

B. Studies of Non-Colleged Degreed Men

There have been only a handful of studies attempting to test the concurrent validity of Holland's theory for non-college-degreed working men. Despite its faulty design and despite the fact that neither of Holland's instruments was utilized, the first of these (Morrison & Arnold, 1974) should be noted. Attributing to Holland the dubious premise that all individuals with the same single-letter high-point code should have virtually identical personalities, Morrison and Arnold set out to test this premise by determining how many differences they might find between four "Realistic" groups on eight traits thought to be characteristic of Realistic types.

Their four groups consisted of heavy equipment operators, coded RIE by Holland (1970); two groups of power station operators (RIS); and laboratory technicians (IRC). The researchers' erroneous inclusion of an occupational group that Holland had previously reclassified as Investigative, coupled with their failure to consider second and third letter codes, led to the mistaken interpretation that, "contrary to Holland's theory, four occupational groups classified within the realistic type did not exhibit similar personalities" (p. 485).

In actuality, as noted in their discussion section, if laboratory technicians had not been included in the analysis, similarities between the groups would have outnumbered differences by a three-to-one margin, thus lending a fair degree of support to the concurrent validity of
Holland's theory for nonprofessional workers.

In assessing the utility of Holland's theory for 89 employed men who were attending a community college to better themselves, Andrews (1975) was alert to the importance of secondary codes. Using VPI scores and Holland's system for classifying jobs (e.g., Holland et al, 1969), Andrews assigned, wherever possible, two-letter codes to each S's personality, present job and expected future job. Eighty-three percent of the subjects were found to be anticipating employment in jobs that matched their personalities as well as or better than their present jobs. This finding lends strong support to Holland's premise that people, including nonprofessional working men, tend to seek vocational environments that are compatible with their personalities, as categorized in his system.

Two studies published in 1976 by Walsh and his associates shed further light on the concurrent validity of Holland's theory for non-college-degreed working men. Fishburne and Walsh (1976) administered the VPI and the SDS to 126 men working in six occupations intended to represent the six vocational orientations: barbers (R), electronic technicians (I), photographers (A), bartenders (S), gas station managers (E), and accounting clerks (C)—all occupations with a maximum educational requirement of high school, technical school or business school. Subjects had held jobs in their fields for at least one year, with mean length of employment ranging from 6.6 yrs. for accounting technicians to 11.2 years for barbers.

For this sample, the concurrent validity of the SDS was better supported than that of the VPI: four scales of the SDS differentiated the groups in the expected manner, whereas only two scales of the VPI
did so. Thus, the findings lent some support to the concurrent validity of Holland's theory for this population. It is interesting to note that two of the occupations that Fishburne and Walsh studied have subsequently been reclassified (Holland, 1977a): barbers to SRC and electronic technicians to RIE. It is studies such as this one that have provided the empirical bases for such refinements.

Somewhat stronger support for the theory's concurrent validity was found in O'Brien and Walsh's (1976) study of non-college-degreed black working men. O'Brien and Walsh administered the VPI and the SDS to 121 subjects who had been employed at least one year (mean 7.6 years) in the following occupations: maintenance men (R), x-ray and lab technicians (I), musicians and entertainers (A), youth leaders (S), salesmen (E), and inventory clerks (C). None of the subjects had completed more than two years of college.

Four of the VPI scales and five of the SDS scales identified occupational groups in accordance with Holland's theory. Black men scoring highest on a particular scale tended to be working in an appropriate occupation. And conversely, occupational groups usually had their highest or second highest mean scores on the appropriate VPI and SDS scales. Thus, these four studies taken together suggest at least moderate support for the concurrent validity of Holland's theory for non-college-degreed working men.

C. Additional Studies of Working Men: Mixed Occupational Levels

In one of the earliest tests of Holland's theory with working men, Hughes (1972) subjected 400 National Guardsmen to a compulsory three-hour battery of tests, including but not limited to the VPI, the SVIB and the Cattell 16 PF. Hughes' study is widely cited for its negative
results: in attempting to test several of the major tenets of Holland's theory, he found no support for the consistency notion, only modest support for the congruence construct, and moderate support for the level hierarchy concept.

To test the congruence construct, Hughes first assigned each subject's occupation a single-letter code, based on Holland's (1970) "Occupation Classification Booklet," a mimeographed forerunner of the Occupations Finder. In some cases, he notes, "there was a question as to the most appropriate placement" (p.386). He then compared this data with the subjects' VPI high-point codes to obtain a "hit" rate. Comparable procedures were employed for calculating hit rates obtained from SVIB data, 16 PF data, and self-rating data.

The hit rate for the VPI, 42%, was higher than all the others but still disappointingly low. To the extent that single-letter coding of information obtained from nonvoluntary subjects can be considered a valid approach to measuring the complexities of person-environment congruence, these results seemed to suggest that Holland's system--especially his "arm-chair" coding of some occupations--was in need of further refinement.

Before proceeding to a discussion of the research on employed women, two other studies of employed men are worthy of mention. Scanlan (1980) extended Holland's theory to self-employed men in his study of male entrepreneurs, members of an occupational category not dealt with in Holland's system nor in vocational psychology in general. Scanlan interviewed and administered the VPI to 64 self-employed businessmen. Following Smith (1967), he classified them into two groups: craft entrepreneurs (C-E's; small-scale business owners primarily interested in producing a product
or service) and opportunistic entrepreneurs (O-E's; primarily oriented toward organization building, growth and expansion).

On the VPI, both groups scored highest on the Enterprising scale, but O-E's scored higher than C-E's. The three-letter code for O-E's was determined to be EAI, and the code for C-E's was ERA. The similarities and differences between the two groups reflected in their respective VPI profiles were found to be consistent with their educational interests, their previously held occupations, and the types of work activities currently occupying their time. This led Scanlon to conclude that "the results of the study gives [sic] additional support to Holland's theory" (p.169).

Finally, in another creative extension of Holland's theory, Melamed and Meir (1981) administered the VPI (and several other measures designed to tap such things as occupational satisfaction and salience of leisure activities) to 240 Australian men working in upper- and lower-level occupations representative of the six vocational orientations. Holland (1973) has postulated that people who make incongruent vocational choices will seek to resolve this dissonance by either moving to a more congruent environment, changing the present environment, or changing their personal orientation. Without doing any violence to Holland's theory, Melamed and Meir proposed a fourth possibility: that people who remain in congruent vocations will compensate for this by seeking congruent avocational pursuits.

Analysis of the data collected in Australia, as well as some comparable data obtained from workers in Israel, led Melamed and Meir to conclude that (1) people tend to select avocational activities congruent with their personality types; (2) vocationally satisfied people in
congruent occupations tend to prefer avocational activities that are extensions of their work activities; and (3) vocationally dissatisfied people in incongruent occupations tend to select compensatory leisure activities, and these activities tend to have higher salience to them. These findings, obtained through inventorying a working sample, are clearly supportive of the concurrent validity of Holland's theory for employed men.

Research With Employed Women

A. A study With Mixed Occupational Levels

To date, there have been ten studies investigating the concurrent validity of Holland's theory for employed women. In the first of these, Werner (1969) administered the VPI and her own Employed Women's Questionnaire to a stratified sample of 348 women working in occupations chosen to represent each of the six vocational orientations: factory workers (R); research scientists (I); teachers (S); bank employees (C); managers and supervisors (E); and commercial artists, interior decorators and writers (A).

The study's primary purpose was to examine the effects of role choice, homogeneity (differentiation), consistency and congruence upon achievement (operationalized as salary) and job satisfaction. With a few exceptions (e.g. consistent E's had higher salaries and congruent C's had higher lengths of stay on the job), the predictor variables, taken separately, did not have significant effects upon the criterion variables. Taken together, however, homogeneity, consistency and congruence did appear to effect salary and satisfaction in accordance with Holland's predictions. Some additional support for the theory
**TABLE 2**

**VALIDITY STUDIES WITH WORKING WOMEN: SUMMARY OF RESULTS**

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Valid SDS Scales</th>
<th>Valid VPI Scales</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mixed-Level Sample</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Werner, 1969</td>
<td>Six types, various levels</td>
<td>NA</td>
<td>NA</td>
<td>Mixed</td>
</tr>
<tr>
<td><strong>College-Degreed Samples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horton &amp; Walsh, 1976</td>
<td>Professionals</td>
<td>_IASEC</td>
<td>RIAS_C</td>
<td>Positive</td>
</tr>
<tr>
<td>Bingham &amp; Walsh, 1978</td>
<td>Black professionals</td>
<td>RI_SEC</td>
<td>_IAS_C</td>
<td>Positive</td>
</tr>
<tr>
<td>Walsh et al, 1979</td>
<td>Professionals</td>
<td>RII**E*</td>
<td>RII**E*</td>
<td>Positive</td>
</tr>
<tr>
<td>Wiggins, 1976</td>
<td>Teachers (EMR)</td>
<td>NA</td>
<td><strong>AS</strong></td>
<td>Positive</td>
</tr>
<tr>
<td>Hener &amp; Meir, 1981</td>
<td>Registered nurses</td>
<td>NA</td>
<td>NA</td>
<td>Positive</td>
</tr>
<tr>
<td><strong>Non-College-Degreed Samples</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harvey &amp; Whinfield, 1973</td>
<td>Continuing ed. enrollees</td>
<td>NA</td>
<td>_IEC</td>
<td>Mixed</td>
</tr>
<tr>
<td>Matthews &amp; Walsh, 1978</td>
<td>Skilled &amp; semiskilled workers</td>
<td>RIAS_C</td>
<td>RIAS_</td>
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</tr>
<tr>
<td>Ward &amp; Walsh, 1981</td>
<td>Skilled &amp; semiskilled blacks</td>
<td>_IASEC</td>
<td>RIASEC</td>
<td>Positive</td>
</tr>
<tr>
<td>Walsh et al, 1983</td>
<td>Skilled &amp; semiskilled workers</td>
<td>*I**C</td>
<td><em>I</em>*</td>
<td>Mixed</td>
</tr>
</tbody>
</table>

* See Table 1.
   _ See Table 1.
was found in the fact that all but 45 of the subjects had VPI profiles that were congruent with Holland's model.

B. Studies of College-Degreed Women

A series of studies by Walsh and his associates helps to shed light on the concurrent validity of Holland's theory for professional-level working women. In the first of these studies, Horton and Walsh (1976) administered the SDS and the VPI to 179 women employed in six occupations: engineers (R), physicians (I), architects (A), ministers (S), lawyers (E), and certified public accountants (C). The results of the multivariate analysis of variance tended to support the hypothesis that there would be significant differences between the mean scores of the six occupational groups on each scale for the two inventories. In the univariate analysis for each scale, the test for the main effect of groups was found to be significant for all six scales of both instruments.

In an interoccupational group analysis, four of the VPI scales (R, A, S and C) and four of the SDS scales (A, S, E and C) identified their respective occupational groups in the expected manner. Conversely, in an intraoccupational group analysis, physicians, architects, ministers and accountants had their highest mean scores on their respective scales (I, A, S and C) of both the VPI and the SDS.

This line of investigation was extended further by Bingham and Walsh (1978), who administered the VPI and the SDS to 93 college-degreed black women employed in occupational environments representative of the six types. Again, the results provided some support for the concurrent validity of Holland's theory: four of the VPI scales and five of the SDS
scales differentiated the groups in the expected manner; in addition, five occupational groups obtained their highest or second highest mean score on the appropriate VPI scale, and five occupational groups did likewise on the SDS.

By pooling the data from two prior studies, Walsh, Bingham, Horton and Spokane (1979) were able to investigate the concurrent validity of Holland's theory for black and white women employed in three traditionally male occupations representing three of Holland's vocational orientations: engineering (R), medicine (I) and law (E). Walsh et al found that the Investigative scale of both the VPI and the SDS differentiated between the black and white women. However, they also found, in comparing the mean scores of whites and blacks in the same occupation on the pertinent scales of the two instruments, that the Realistic, Investigative and Enterprising scales did not differentiate among blacks and whites in the same occupation. That is, black and white female physicians obtained similar raw scores on the Investigative scale, white and black engineers scored similarly on the Realistic scale, and black and white lawyers obtained similar scores on the Enterprising scale.

Furthermore, as secondary analysis (Tukey b test) revealed that the intergroup relations of scale scores were generally in keeping with Holland's theory. The engineers—both black and white—tended to score higher on the Realistic scale of both instruments than black and white physicians and lawyers. Likewise, physicians of both races tended to score higher than lawyers on the Investigative scale, and both sets of lawyers tended to score higher than physicians and engineers on the Enterprising scale. These findings, taken in combination with Walsh,
Horton & Gaffey's (1977) finding of few differences between men and women in engineering, medicine and the ministry, tend to support the concurrent validity of Holland's theory for college-degreed women—black or white—employed in traditionally male occupations.

The aforementioned studies, then, have provided support for applying Holland's model to college-degreed working women. A fourth study, by Wiggins (1976), provides some additional support. Wiggins administered the VPI and the Hoppock Job Satisfaction Blank (HJSB) to virtually all (110 of 126) the teachers of the educable mentally retarded in the state of Delaware. He found strong support for Holland's (1970a, 1973) SAI coding of this occupation and his assumption that degree of resemblance to the SAI type should predict degree of job satisfaction.

Whereas job satisfaction for this sample was not significantly related to certification, degree, or teaching level, it did correlate significantly ($p < .01$) with scores on the Social (.56), Artistic (.29), Realistic (-.54), and Conventional (-.37) scales of the VPI. Furthermore, when subjects were sorted into "high", "medium" and "low" satisfaction groups, analysis of variance revealed that the high and medium groups both scored significantly higher than the low group on the Social and Artistic scales, with the reverse being the case for the Realistic and Conventional scales (polar opposites to Social and Artistic in the hexagonal model).

These findings—of a significant positive relationship between job satisfaction and Social-Artistic characteristics and a significant negative relationship between job satisfaction and Realistic—
Conventional characteristics— are precisely in keeping with Holland's theory. Given the representativeness of this sample, the concurrent validity of Holland's theory for female teachers of the Educable Mentally Retarded seems well supported.

The last study to be reviewed in this section is Hener and Meir's (1981) investigation of predictors of job satisfaction among nurses. Although neither of Holland's instruments was used in the study, its consideration is warranted here, due to the fact that it involved an indirect test of the concurrent validity of Holland's theory for nurses, one of the occupations selected for inclusion in the present investigation.

Noting that most recent tests of Holland's hypotheses of congruence, consistency and differentiation have focused on inter-occupational differences, Hener and Meir argued that those studies that yielded negative results may have done so because of ignoring differences that exist within a given occupation. Choosing, then, to focus on one occupation—nursing—Hener and Meir administered an instrument of their own devising, the List of Courses in Nursing (LCN), to 126 female registered nurses, in order to assess the effects of congruence, consistency and differentiation on the nurses' job satisfaction. The nurses ranged in age from 22 to 60, with experience from 1 to 30 years (median: 11). Half were supervisors, and half were primary care nurses.

The LCN yields a profile of nine scores representing the S's relative degrees of interest in each of nine clinical specialty areas within nursing (e.g., Maternity Nursing, Mental Health Nursing, Surgical Nursing). The interrelationships among the nine clinical areas were
plotted on a two-dimensional map similar to Holland's hexagon, which showed, for example, a high degree of similarity between Surgical Nursing, Medical Nursing and Emergency and Intensive Care Nursing and a low degree of similarity between Operating-Room Nursing and Mental Health Nursing.

Congruence, consistency and differentiation scores for each S were then arrived at in a manner similar to utilizing Holland's hexagon. Degree of congruence was scored between 1 and 4 depending on the goodness-of-fit between a subject's highest LCN score and her actual clinical area of work. Consistency was also scored on a 1-to-4 scale, based on the degree of correspondence between a subject's highest and second highest LNC scores. Finally, a differentiation score was calculated based on the difference between a subject's highest and lowest LCN scores.

The results were generally in line with predictions from Holland's theory. Congruence, as defined above, was found to contribute to job satisfaction (JS). The correlation between congruence and JS was found to be 0.44 (p < .01): the higher the level of congruence, the higher the level of job satisfaction. Support for the consistency and differentiation hypotheses was weak: when congruence and incongruence were disregarded, the correlation between consistency and JS was only 0.20 (p < .05), and the correlation between differentiation and JS was only 0.18 (p < .05). However, a trend analysis revealed that, additively, congruence, consistency and differentiation had a cumulative positive effect on JS. That is, those nurses who were highest in congruence, consistency and differentiation were also highest in job satisfaction, and those who were lowest in congruence, consistency and differentiation were lowest in job satisfaction.
These findings, then, add some further support to the concurrent validity of Holland's theory for professional-level employed women.

C. Studies of Non-College-Degreed Women

Although it did not actually involve an employed sample (on the average, Ss had not worked outside the home for ten years), Harvey and Whinfield's (1973) study was the first to assess the utility of Holland's theory for non-college degreed women. (Only 32% of their subjects held college degrees.) Harvey and Whinfield administered the VPI and four criterion tests (the SVIB-W, the EPPS, the DAT, and the Allport-Vernon-Lindzey SOV) to 61 women enrolled in a testing and guidance program offered through a northeastern university's continuing education department. The women were predominantly upper-middle-class homemakers, and they tended to be classified Realistic and Conventional by the VPI. They had a mean age of 40.7, a mean educational level of 13.72, a mean number of years worked of 7.32. The researchers' intention was to test the construct validity of the VPI for this sample, examining the strength of the correlations of its six vocational orientation scales with appropriate scales from the four criterion measures.

For the Intellectual (Investigative), Conventional and Enterprising scales, numerous significant relationships were found that were consistent with the theory. For example, Enterprising correlated positively with the SVIB's Buyer scale and the SOV's Economic scale and negatively with the EPPS's Intraception Scale. On the other hand, for the Social, Artistic and Realistic scales, some significant relationships supporting the theory were found, but a large number of expected relationships were not found. These results, then, were mixed, but the limitations of the
study's design suggest that they must be interpreted with caution.

More definitive results were later obtained in a series of studies by Walsh et al. Matthews and Walsh (1978) found some support for the theory's concurrent validity when they administered the VPI and the SDS to 114 non-college-degreed women working as assemblers (Realistic), lab technicians (Investigative), floral designers (Artistic), ward attendants (Social), Salespersons (Enterprising), and clerk-typists (Conventional). Subjects had been employed for at least one year, with 6.6 years being the average. They ranged in age from 19 to 60, with a mean of 35.4.

Five of the SDS scales (all but Enterprising) but only three of the VPI scales (Realistic, Artistic and Social) were found to identify the occupational groups in accordance with Holland's theory. For each instrument, three of the six occupational groups obtained their highest or second highest score on the appropriate scale.

Interestingly, in examining the table of means more closely, one finds that for this all-female sample, Social was the highest or second highest code for all of the six groups on both of the instruments, and that Conventional was the next most prominent code, ranking first or second highest for three of the groups on one or both of the instruments. If occupations as diverse as assembler and salesperson were to be re-coded based on the results of this study, they would both be coded SCE. This further documents the pervasiveness of Social and Conventional Vocational orientations among women and add some support to the argument that Holland's six-factor classification scheme seems to apply less well to women (especially non-college-degreed women) than to men.
Ward and Walsh (1981) investigated the concurrent validity of Holland's theory for non-college-degreed black women by administering the VPI and the SDS to the following groups: 17 maids (Realistic), 16 X-ray technicians (Investigative), 12 florists and dancers (Artistic), 18 teacher aids (Social), 16 sales clerks (Enterprising), and 23 clerk-typists (Conventional). They found some support for the theory as applied to this population, in that the Realistic, Investigative, Artistic and Enterprising scales of the VPI correctly identified their corresponding occupational groups, and the Investigative, Artistic, Enterprising and Conventional scales of the SDS did same. In addition, all groups but maids scored highest or second highest on the appropriate scale of both of the instruments. Furthermore, correlations for the same-named scales of the two inventories were all significant and relatively high, ranging from .61 (Realistic) to .80 (Enterprising).

In this study the one scale that failed to differentiate between the occupational groups on either inventory was the Social scale. All the groups tended to score high on the VPI Social scale and the SDS Social scale. This finding is consistent with other studies (e.g., O'Brien & Walsh, 1976; Bingham & Walsh, 1978) in which blacks have shown a particularly high Social orientation. If blacks tend to score high on Social and if women tend to score high on Social (as noted above), then it is certainly not surprising that the Social scale would lack discriminatory power for this sample of black women.

In an investigation parallelling the Walsh et al (1979) study cited above, which found few differences between black and white college-degreed working women, Walsh, Hildebrand, Ward and Matthews (1983) pooled
the Matthews and Walsh (1978) and Ward and Walsh (1981) data to test the hypothesis that there would be no differences between blacks and whites employed in the three occupations common to the two studies: laboratory technicians, sales persons, and clerk-typists. These occupations represent three of Holland's vocational environments: Investigative, Enterprising, and Conventional.

The results were mixed. On the VPI, the Enterprising and Conventional scales did differentiate between whites and blacks employed in the same occupation (with blacks scoring higher); the Investigative scale did not. On the SDS, the Enterprising scale differentiated between black and white sales clerks (higher scores for blacks); the Investigative and Conventional scales did not differentiate between white and black occupational groups. These findings are quite consistent with the findings of Doughtie, Chang, Alston, Wakefield and Yom (1976), that black college students scored higher than white college students on the Social, Conventional and Enterprising scales of the VPI.

On the other hand, an additional finding in the Walsh et al (1983) study is at variance with Doughtie et al (1976): the three white groups peaked a total of four times on the Social scale of the VPI and the SDS, whereas the black groups peaked on the Social scale only once. Furthermore, there were more occupation-appropriate peak scale scores for black groups than for the white groups (five out of a possible six for blacks versus two of six for whites). These three studies taken together, then, lend some support to the concurrent validity of Holland's theory for non-college-degreed working women. Among these blue- and white-collar workers, the theory seems more strongly supported for black women than for
white women.

Research With Employed Men and Women (Mixed Samples)

In this section 13 studies involving mixed male-female samples will be reviewed. Although some of these studies are less directly pertinent to the present investigation than the studies reviewed above and those to be reviewed in the following sections, they do shed additional light on the concurrent validity of Holland's theory for working adults; and some touch on the question of sex differences, a topic which will be dealt with more fully in the two following sections.

A. Studies With Mixed Occupational Levels

Holland and Holland (1977) examined SDS and VPI data from their files for 46 clinical psychologists (coded ISA at that time), 45 medical technologists (ISA), 113 career counselors (SEA), and 53 bank tellers (CRS). Checking high-point codes, they found that one to three of the expected types tended to dominate each field, and conversely, that two to four types seldom occurred within each field. For example, 80% of the career counselors had a high-point code of either S, A or E (in that order), with high-point codes of I, R and C occurring, respectively, in only 14, 5 and 0% of cases. These data are supportive of the theory's concurrent validity for the four occupations in question.

Turner and Horn (1977) analyzed the 16PF profiles of 215 men typed by their actual occupations (according to Holland's, 1973, Occupations Finder). The results tended to be supportive of Holland's theory: the six groups were found to have personality characteristics generally
consistent with Holland's characterizations of the six types, with differences in tender-mindedness and self-confidence tending to separate the groups in accordance with theoretical predictions. In addition, the wives of Social and Enterprising men were found to be significantly similar to their husbands on personality dimensions relevant to the theory.

In 1978 Mount and Muchinsky published two studies based on SDS data from 362 occupational workers representing five of the six types (all but Artistic) and a mixture of occupational levels (fire-fighters, business managers, secretaries, etc.). Subjects' occupations were assigned occupational codes according to Holland's (1973) Occupations Finder. In both studies (1978a & 1978b) Mount and Muchinsky defined congruence as a match between the first letter of a subject's SDS summary code and the first letter of that subject's occupational code.

Using this rather stringent definition, the researchers found congruence for 61 of 73 Ss working in Realistic environments, 49 of 74 for Investigative, 64 of 80 for Social, 47 of 68 for Enterprising, and 56 of 67 for Conventional. That is, most of the Ss were working in environments that were congruent with their personality types. Tests of significance upheld this observation, providing "strong validational support for Holland's theory" (1978b, p. 352) but not for the hexagonal model's depiction of the interrelationships between environments.

In addition to the above, Mount and Muchinsky (1978a) investigated the relationship between congruence and job satisfaction for this employed sample. They found, for the sample as a whole, that congruent
subjects were more satisfied than incongruent subjects with all aspects of their work that were measured: the work itself, the pay, opportunities for promotion, supervision, co-workers on the job, and overall satisfaction. However, when the five typological groups were considered separately, the magnitude of the congruence effect was found to vary considerably from group to group. These results, then, lend some support to the validity of Holland’s congruence-satisfaction hypothesis for a working sample.

In an interesting extension of the research on concurrent and construct validity, Warren, Winer and Dailey (1981) administered the VPI and a retrospective work history questionnaire to 65 men and women, mostly retirees, who ranged in age from 50 to 88. A one-letter code was assigned to each participant’s first full-time job, longest full-time job, last job (if retired), and present job (if employed). No Artistic work histories were represented in the sample, but the data for the remaining five types lent support to the validity of Holland’s theory. At each stage of their work histories, there was substantial congruence between Ss’ occupational codes and VPI codes: with the exception of Ss with Conventional work histories (mostly women), Ss tended to score highest on the VPI scales that were appropriate for their occupations. For the sample as a whole, statistically significant relationships existed between tested Holland type and first, longest and current occupations.

Meir and Hasson (1982) administered the Activities, Competencies and Occupations sections of the Hebrew version of the SDS to 71 couples from three Israeli settlements (one industrial and two agricultural), in order to study the relationship between person-environment (settlement) congruence
<table>
<thead>
<tr>
<th>Study</th>
<th>Valid Sample</th>
<th>SDS Scales</th>
<th>VPI Scales</th>
<th>Outcome</th>
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<td>Mount &amp; Muchinsky, 1978a &amp; 1978b</td>
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</tr>
<tr>
<td>Warren et al, 1981</td>
<td>Retirees</td>
<td>NA</td>
<td>RI*SEC</td>
<td>Positive</td>
</tr>
<tr>
<td>Meir &amp; Hasson, 1982</td>
<td>Israeli settlers</td>
<td>RI***</td>
<td>NA</td>
<td>Positive</td>
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<td><strong>College-Degreed Samples</strong></td>
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<td>Helson, 1978</td>
<td>Authors &amp; critics</td>
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</tr>
<tr>
<td>Aranya et al, 1981</td>
<td>Accountants</td>
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<td>Salomone &amp; Slaney, 1978</td>
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<td>Johnson &amp; Hogan, 1981</td>
<td>Police officers</td>
<td>R<em>AS</em>C</td>
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* See Table 1.
  See Table 1.
and inclination to stay and social acceptance. Each subject's personality type was identified by a two-letter SDS code, and the type of environment for each settlement was determined by the modal personality of its members.

For each of the three settlements, not surprisingly, S was the modal personality for women. For men, consistent with the theory, the two agricultural settlements were R environments and the industrial environment was IR/RI (having an equal number of R and I members). The correlation between congruence level and social acceptance was low and nonsignificant, but the correlation between congruence level and inclination to stay was moderately high (.44) and significant: the tendency for couples to remain in a settlement was related to the extent to which either or both partners' personality type was congruent with the modal personality type for his or her sex. This study, then, lends some additional support to the concurrent validity of Holland's theory for working adults.

B. Studies of College-Degreed Men and Women

Although it did not involve Holland's instrumentation, Helson's (1978) study of writers and critics merits mention as a contribution to the concurrent validity literature. Helson administered the SVIB and several other instruments to 58 writers and 59 critics of children's literature. On the SVIB indicator scales designated by Holland (1966), both groups scored as Artistic types with consistent profiles, with authors being more differentiated than critics, and critics (appropriately) being relatively more Social and Conventional than authors. These results are in harmony with Holland's theory. An additional finding, which is germane to the present investigation, was that scores for men and women within the two fields did not differ significantly.
Aranya, Barak and Amernic (1981) tested Holland's theory in a large random sample \( N = 2,148 \) of certified public accountants (CPAs) working in Canada and California. Noting that Holland (1977a) codes accountant as CES and certified public accountant as CIS, and that various researchers have produced conflicting evidence of accountants being characterized by various combinations of C, R, I, E, and S themes, Aranya et al set out to obtain a more definitive picture of the CPA personality by administering the SDS to this broad, cross-cultural sample.

They found that codes consisting of various combinations of C, E and S accounted for the personality patterns of 28% of their sample. (Other possible patterns accounted for no more than 1.5% each.) ESC was the most common code, followed closely by CES and CSE. In addition, scores on the Conventional, Enterprising and Social scales were generally positively correlated with commitment to work and vocational satisfaction, whereas scores on the Realistic, Investigative and Artistic scales were negatively related to commitment and satisfaction. These results lend some support to Holland's theory, demonstrating that his CES coding of accountant seems appropriate but raising questions about his CIS coding of CPA.

Three studies by Wiggins and his associates shed further light on the concurrent validity of Holland's theory for public school personnel (teachers and counselors). In the first of these, Wiggins and Weslander (1979) administered the VPI to a representative sample of school counselors (160 women and 160 men) in four northeastern states. The subjects' job satisfaction and their supervisors' ratings of their counseling effectiveness correlated positively with the Social and Artistic scales and negatively with the Realistic and Conventional scales of the VPI. On the other hand, Ss' age, sex, years of experience, employment level, certification, and
degree status were not predictive of rated effectiveness. Counselors rated highly effective had a group code of SAI, whereas those rated ineffective had an RCE code.

These results tend to support Holland's theory and his (1977a) SIA coding of this occupation. A further finding, which is pertinent to the present investigation (and also supportive of the theory), is that there were no significant differences between female and male counselors on any of the VPI vocational orientation scales: as in the Helson (1978) study noted above, men and women employed in this occupation appear to be far more similar than different in personality factors related to vocational choice.

In the second study to assess the applicability of Holland's theory to retirees, Wiggins (1982) administered the VPI to 102 retired teachers whose teaching fields had represented five of Holland's six classifications: vocational agriculture (RSI), history (SIC), mathematics (ISC), business (CSE), and English (ASE). Using his Compatibility Index (CI), a 9-point scale for measuring the congruence between expected Holland code and obtained Holland code, Wiggins found that 98 of the 102 Ss scored at or above the CI midpoint.

The obtained codes for vocational agriculture teachers (RSI), business teachers (CSE), and English teachers (ASE) exactly matched the expected Holland (1977a) codes; and the obtained codes for history teachers (SIA) and mathematics teachers (SIC/A) very closely matched the expected codes. Since individuals who have remained in their occupation until retirement should be representative of congruent, satisfied members of that occupation, these results are clearly supportive of the concurrent validity of Holland's theory.
Wiggins extended this line of investigation further when he and his associates (Wiggins, Lederer, Salkowe, & Rys, 1983) administered the VPI and the Job Satisfaction Blank (JSB) to 247 teachers sampled from four states. The subjects' teaching fields were the five fields noted above (representing five of Holland's environments), and their number of years of teaching experience ranged from 1 to 36. The researchers found that for 13 variables studied, person-environment congruence, as measured by the Compatibility Index (CI), was the single best predictor of job satisfaction, and that differentiation was the next best predictor. Although VPI scale scores and CI scores were not reported by teaching field or by sex, the authors did note that, for the sample as a whole, job satisfaction correlated positively with Social and Investigative and negatively with Realistic—an expected finding for teachers. These results are clearly supportive of Holland's theory. Taken together, then, the above five studies offer additional evidence of Holland's theory and its instrumentation having validity for college-degreed workers.

C. Studies of Non-College-Degreed Men and Women

An important addition to the literature on applying Holland's theory to nonprofessional workers was Salomone and Slaney's (1978) study of 470 male and 447 female blue-collar workers, employed in jobs representing all six of Holland's orientations, in five northeastern states. The workers had been employed in their current jobs from 1 to 15 years and ranged in age from 18 to 63 years. In the course of a battery of testing, they were administered the VPI and a self-description task involving adjectives used by Holland (1973) to describe the six types. In addition, each subject's job was assigned a three-letter Holland code in accordance with the Occupations Finder. These data were then used to examine congruence between
VPI scores and actual jobs and between VPI scores and self-descriptions.

The researchers found, first, that significant proportions of both male and female workers had personality orientations congruent with their jobs. For both sexes, the observed frequencies in the diagonal cells of the 6 x 6 chi-square table were more than twice the size of the expected frequencies. Secondly, the researchers found "unequivocal support" (p.69) for the hypothesis that nonprofessional workers would perceive groups of adjectives as self-descriptive that were consistent with their tested personal orientations. Contrary to the findings of some of the earlier researchers (Hughes, 1972; Harvey & Whinfield, 1973; Morrison & Arnold, 1974), these results are clearly supportive of the concurrent validity of Holland's theory for non-college-degreed workers.

Another study of non-college-degreed workers with findings supportive of Holland's theory was Johnson and Hogan's (1981) investigation of predictors of effective police performance. Johnson and Hogan administered the SDS to 50 police officers who had been on the force in a Baltimore suburb for one to four years. They also administered the SDS to 38 cadets who were enrolled in the department's police academy. Both groups had their highest (virtually tied) scores on the Realistic and Social scales of the SDS and their lowest scores on the Conventional and Artistic scales. This finding lends support to Holland's coding(s) of this occupation (1970--RSI; 1977a--SRE), and hence, to the concurrent validity of his theory.

The study's major finding, however, pertains to the Artistic and Conventional Scales. Following Campbell (1971), the researchers reasoned that scales other than those defining the given occupation may tap personality characteristics less common to the occupational group that contribute
to superior work performance. Noting that Artistic characteristics (emotional, impulsive, nonconforming, original) would be counterproductive in police work and that Conventional characteristics (conforming, orderly, persistent, self-controlled) would be assets, Johnson and Hogan hypothesized that scores on these scales would be predictive of effective police performance.

The data tended to support this hypothesis (and thus, the construct validity of Holland's theory): the Artistic scale correlated in the predicted direction with three criteria of performance effectiveness, and the Conventional scale correlated as expected with two such criteria (although correlations were fairly low, .21 to .34, and were not always significant). The above two studies, then, lend support to the concurrent validity of Holland's theory for non-college-degreed workers--support that is more clear-cut than some of the evidence reviewed previously.

**Research Comparing Employed Men and Employed Women**

In this fourth section, we now turn our attention to the relatively small body of literature that is most directly pertinent to the present investigation: five studies of concurrent validity of Holland's theory which focus on the question of sex differences in samples of employed adults. This literature--taken in combination with the literature to be reviewed in the subsequent section, on sex as a career development variable--constitutes the foundation upon which will be built the present investigation of the concurrent validity of Holland's theory for men and women employed in traditionally female occupations.

Before discussing these five studies, however, mention should be made of the first study that attempted to examine the question of whether men and
women in the same occupation have similar Holland codes (Prediger & Hanson, 1976). Although this study does not satisfy all the criteria for inclusion in this literature review (using Holland's instruments to test his theory's concurrent validity for a working sample), Prediger and Hanson's findings should be noted before moving on to a discussion of the (more recent) work of other investigators that has more direct bearing on the question of concurrent validity.

In order to test an assumption that seems to be implicit in Holland's theory—that women and men in the same occupation have the same personality pattern (Holland code), Prediger and Hanson examined Holland code data for three large national samples of male and female Ss who were at various stages of selecting and pursuing 104 different occupations. It should be noted that the authors' exhaustive analyses of these data rested in large part on two somewhat tenuous assumptions: (1) that data from students expecting to pursue an occupation are comparable to and interchangeable with data from older Ss who have been employed in a given occupation for a number of years, and (2) that Holland raw score codes extrapolated from instruments not designed to yield Holland raw score codes are comparable to and interchangeable with VPI raw score codes.

The three data sources utilized in this study were the following: (1) Project TALENT interest measures for high school students who were followed up five years later, (2) VPI profiles of occupational preference groups comprised of college students, and (3) SVIB criterion group data used in developing the SVIB-Holland scales. Since no evidence is provided that the Project TALENT group was representative of employed adults, and the VPI sample consisted entirely of students, the SVIB data would seem to be relatively more useful than the other two data sources for making inferences concerning
concurrent validity for a working sample.

The authors found, first of all, that there were "numerous" instances of male and female Ss pursuing the same occupation but not having the same Holland code, especially when raw score codes, rather than standard score codes (based on same-sex norms) were used. Not surprisingly, the percentage of matching codes varied in accordance with how precise the match was expected to be. For the SVIB scores, for example, single-letter high-point codes matched 80% of the time when raw scores were used and 80% of the time when standard scores were used; and these figures dropped to 37% and 43%, respectively, when matching was defined as having the two highest scales in the same order.

The findings concerning possible personality differences between men and women in nontraditional occupations are of particular interest here. When the three data banks were pooled (averaging "apples" and "oranges"?), it was found that the match between female and male codes was particularly poor for Ss pursuing stereotypically masculine or feminine occupations. Female Ss pursuing Investigative, Enterprising and Realistic occupations obtained conspicuously fewer I, E and R codes than male Ss; they tended, instead, to obtain S and A codes. Conversely, male Ss pursuing traditionally female SA occupations (e.g. elementary teacher or hair dresser) most frequently obtained I and S codes, whereas female Ss pursuing those occupations tended to obtain SA codes. Again, these discrepancies were reduced when standard scores rather than raw scores were used. These results, then, are not supportive of the concurrent validity of Holland's theory for women employed in traditionally male occupations and men employed in traditionally female occupations. However, these results must be viewed as tentative, pending replication by studies using more appropriate instrumentation with
samples that are more clearly representative of working adults. The results that have been subsequently obtained with studies of working adults are mixed, but on the whole, they are more supportive of Holland's theory than were Prediger and Hanson's. In all, there are seven such studies involving comparisons between female and male employed adults. (See tables 4 and 5.) Three of these (Helson, 1978; Salomone & Slaney, 1978; Wiggins & Weslander, 1979) were reviewed in the previous section, and the other four will be reviewed here. (See Table 4.) An eighth study (Hecht, 1980), comparing male and female nursing students, will also be discussed, due to the pertinence of its findings to the present investigation.

Although their studies were not designed primarily as investigations of sex differences, it should be reiterated that Helson (1978) found no differences in the vocational orientation scores of male and female authors and critics; Wiggins and Weslander (1979) found no differences between female and male counselors on any of the VPI vocational orientation scales; and Salomone and Slaney's (1978) study of nonprofessional workers revealed that both male and female workers tended to have VPI profiles that were congruent with their work environments. Three studies that were designed to test for sex differences within vocational groups were conducted by Walsh and his associates in the late 1970's.

In the first of these, Walsh, Horton and Gaffey (1977) pooled the data from two prior studies to investigate personality differences between college-degreed women and men employed in three traditionally male occupations (engineering, medicine and the ministry) corresponding to three of Holland's environments (Realistic, Investigative and Social). All Ss had taken the VPI and the SDS, and the raw scores for men and women on the pertinent scales of both inventories (R, I and S) were analyzed.
<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Valid SDS Scales</th>
<th>Valid VPI Scales</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walsh et al, 1977</td>
<td>Professionals in trad'l. male occs.</td>
<td>RI<em>S** I</em>S**</td>
<td>I<em>S** I</em>S**</td>
<td>Positive</td>
</tr>
<tr>
<td>Spokane &amp; Walsh, 1978</td>
<td>Insurance mgrs. &amp; route sales persons</td>
<td>**<em>SE</em> **<em>SE</em></td>
<td>**<em>E</em> **<em>SE</em></td>
<td>Positive</td>
</tr>
<tr>
<td>Doty &amp; Betz, 1979</td>
<td>Sales mgrs.</td>
<td>**<em>SE</em> **<em>SE</em></td>
<td>NA NA</td>
<td>Positive</td>
</tr>
</tbody>
</table>

* See Table 1.
_ See Table 1.
Contrary to Prediger and Hanson's (1976) findings, Walsh et al found that men in these traditionally male occupations tended not to score higher than women in the same occupations. The Realistic scale of the VPI did not differentiate between the male and female engineers, although men did score higher than women on the Realistic scale of the SDS. Furthermore, the Investigative scale of both instruments did not differentiate between female and male physicians. Finally, the Social scale of the VPI did not differentiate between male and female ministers, but the Social scale of the SDS did differentiate between the two groups, with female ministers scoring higher than their counterparts.

Male and female engineers both obtained their highest scores on the Investigative scale(s) of both instruments—a finding that is in keeping with other research on engineers (e.g. Lacey, 1971; Erez & Shneorson, 1980) and with Holland's (1977a) present coding of the occupation. Likewise, female and male physicians both obtained their highest scores on the Investigative scales(s) of both instruments—and their second highest scores on the Social scale(s). Finally, male and female ministers both obtained their highest scores on the Social scale(s) of both instruments and their second highest scores on the Investigative scale(s). Thus, the mean raw scores obtained by men and women on Holland's instruments in this study were far more similar than different. These findings tend to support the theory's concurrent validity for college-degreed females (and males) employed in traditionally male occupations.

The next study to explore the concurrent validity of Holland's theory for employed men vis-a-vis employed women was Spokane and Walsh's (1978) investigation of occupational level differences among women and men working in Enterprising environments. Spokane and Walsh administered the VPI and the SDS
to 42 male and 42 female Ss working at high and low occupational levels in two occupations coded ES (insurance managers and route salespersons). Ss, aged 21 to 67, had all been employed in their respective occupations at least one year.

Spokane and Walsh found that all four groups' mean scores on the two inventories were generally consistent with Holland's theory. Male managers obtained scores coded EAS/ESR on the VPI and the SDS respectively, and female managers scored EAS/SEC. Male salespersons' scores were coded ERA/ESR, while female salespersons obtained codes of ESA/SEC. Thus, viewed from the perspective of three-letter codes for occupational groups, men and women's scores were found to be more similar than different. Sex differences were noted in univariate analyses of variance—with females as a group tending to score lower than males on Realistic and Enterprising and higher on Social, Conventional and Artistic—however, these findings were viewed as tentative due to sampling limitations. These results, then, lend some support to the concurrent validity of Holland's theory and instrumentation for women and men employed in two traditionally male, Enterprising occupations.

In a study published the following year, Doty and Betz (1979) also investigated the applicability of Holland's theory to women (and men) employed in the traditionally male, Enterprising occupation of sales manager. They administered the SDS, the SCII, and the Hoppock Job Satisfaction Blank to 45 male and 43 female sales managers employed nationwide by the same pharmaceutical firm. Ss ranged in age from 22 to 45 and had been employed as managers an average of 2 years. The researchers found clear support for the concurrent of Holland's theory for both female and male managers.

On both the SDS and the SCII, men and women in this ES occupation obtained their highest scores on Enterprising and their second or third
highest scores on Social. On the SDS, male managers were identified as ESI types, female managers as ESA. On the SCII, male managers obtained an ESR code when combined-sex norms were used and an ESA code when same-sex norms were used; female managers scored EAS under both conditions. For both instruments, women's mean scores on the E scale were at least as high as those obtained by men.

Furthermore, Enterprising was the dominant theme for both women and men, regardless of which of the three methods was utilized for computing Holland codes. On the SDS, 100% of both groups had E as the first, second or third letter of their codes, and on the SCII the E theme was actually somewhat more prominent in women's codes than in men's. Differences between men and women on the Realistic, Artistic and Social scales of the SDS and SCII (combined-sex norms) were in the direction of sex differences usually reported by other investigators (e.g. Spokane and Walsh, 1978, as noted above). Finally, the researchers found a moderate relationship between job satisfaction and the E and S scales for both women and men. These results, then, lend further support to the concurrent validity of Holland's theory for men and women employed in a traditionally male occupation.

The last such study to be reviewed here is Benninger and Walsh's (1980) investigation of non-college-degreed men and women employed in traditional male occupations. Benninger and Walsh administered the VPI and the SDS to 103 male and female nonprofessional workers employed in occupations corresponding to three of Holland's model environments: bus and taxi drivers (Realistic), police officers (Social), and car sales agents (Enterprising). Male subjects ranged in age from 21 to 62 and had a mean number of working years of 8.6. Female subjects ranged in age from 23 to 57 and had worked an average of 3.7 years.
Citing some of the findings noted above, the authors hypothesized no differences in mean raw scores among women and men in these three occupational categories. The results were mixed. Male and female Ss employed in the ES occupation of automotive sales (Holland, 1977a) obtained virtually identical results on the pertinent scales of both inventories. On the SDS, female and male car sales agents both scored highest on Enterprising and second highest on Social. On the VPI women again scored highest on Enterprising and second highest on Social, whereas men scored highest on Enterprising and second highest on Realistic—not a surprising finding, considering the nature of the product being sold. (The third letter in Holland's code for this occupation is R). Stated differently, the Enterprising scale of both instruments did not discriminate between male and female car sales agents.

Among police officers, the VPI's Social scale also did not differentiate between women and men, but the SDS's Social scale did. Female police officers obtained codes of SAE and SEA on the VPI and SDS respectively, whereas male police officers obtained codes of RES and SRE. Despite these differences, the similarities between men's and women's scores were striking: S and E themes were prominent in the VPI and SDS results for both sexes. This is quite consistent with Holland's (1977a) SRE coding and Campbell's (1977) RES coding of this occupation.

The difference between female and male police officers appears to revolve around the relatively greater prominence of traditional R themes among men and S and A themes among women. This finding sheds some further light on the open question of whether this should be considered a Social or a Realistic occupation (Johnson & Hogan, 1981). As Benninger and Walsh have suggested (p.86), it may be that the male police officer is more of a
Realistic type and the female police officer is more of a Social type.

The absence of a Realistic orientation among women in a Realistic occupation was most clearly apparent in the last occupational group tested by Benninger and Walsh. The Realistic scale of both instruments effectively discriminated between male and female bus and taxi drivers, with men scoring higher on this scale (R) than any other scale and women scoring significantly lower. Whereas male drivers scored highest on the R, E, S and C scales of the two inventories (consistent with Holland's, 1977a, coding), Female drivers tended to score highest on A, S, E & C. Again, there are similarities, but the most notable difference between the two sexes is the prominence of Artistic and Social orientations among women in two occupations that are dominated by Realistic men. This finding stands out from many other findings reviewed above as being in harmony with Prediger and Hanson's (1976) original interpretation of their data. It is also consistent with the data reported by Salomone and Slaney (1978, p. 67).

Benninger and Walsh's (1980) study, then, offers strong support for the concurrent validity of Holland's theory for women in a traditionally male, Enterprising occupation (cf. Spokane & Walsh, 1978; Doty & Betz, 1979), somewhat equivocal support for applying the theory to women pursuing a traditionally male Social/Realistic occupation, and practically no support for the theory's validity among women in a traditionally male Realistic occupation. Thus, these findings are not unlike the overall findings of the above eight studies taken together: the results are mixed, but they seem to indicate that the similarities between men and women employed in the same occupation generally outweigh the differences.

To date, only one study (Prediger and Hanson, 1976) has found clear-cut sex differences in vocational orientation within various occupational
TABLE 5
STUDIES EXPLORING SEX DIFFERENCES IN HOLLAND RAW SCORES WITHIN OCCUPATIONS:
SUMMARY OF RESULTS FOR EMPLOYED AND SOON-TO-BE-EMPLOYED SAMPLES

<table>
<thead>
<tr>
<th>Study</th>
<th>Sample</th>
<th>Instruments</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prediger &amp; Hanson, 1976</td>
<td>National samples</td>
<td>Project TALENT measures, SVIB, VPI</td>
<td>Numerous sex diffs., esp. in nontrad'l. occupations (nontrad'l. women tending toward SA, &amp; nontrad'l. men tending toward I &amp; S)</td>
</tr>
<tr>
<td>Walsh et al., 1977</td>
<td>Professionals in trad'l. male occs.</td>
<td>VPI, SDS</td>
<td>Few sex diffs, (male engineers somewhat higher on R &amp; female ministers somewhat higher on S)</td>
</tr>
<tr>
<td>Helson, 1978</td>
<td>Authors &amp; critics</td>
<td>SVIB</td>
<td>No sex differences</td>
</tr>
<tr>
<td>Salomone &amp; Slaney, 1978</td>
<td>Non-professional workers</td>
<td>VPI</td>
<td>Concurrent validity for both sexes</td>
</tr>
<tr>
<td>Spokane &amp; Walsh, 1978</td>
<td>Insurance mrs. &amp; Salespersons (trad'l. male occs., 2 levels)</td>
<td>VPI, SDS</td>
<td>Substantial similarities between sexes, but some differences</td>
</tr>
<tr>
<td>Doty &amp; Betz, 1979</td>
<td>Sales mrs. (trad'l. male occupation)</td>
<td>SDS, SCII</td>
<td>Few sex diffs.; theory as valid for women as men</td>
</tr>
<tr>
<td>Wiggins &amp; Weslander, 1979</td>
<td>School counselors</td>
<td>VPI</td>
<td>No sex differences</td>
</tr>
<tr>
<td>Benninger &amp; Walsh, 1980</td>
<td>Nonprofessionals in trad'l. male occs.</td>
<td>VPI, SDS</td>
<td>Few sex diffs. in S &amp; E occs., but women in R occ(s). tended toward A &amp; S.</td>
</tr>
<tr>
<td>Hecht, 1980</td>
<td>Student nurses</td>
<td>SDS</td>
<td>Sex diffs. (more S codes among women, more I &amp; R codes among men) were nonsignificant.</td>
</tr>
</tbody>
</table>
groups. Every other study has failed to substantiate those findings, either in whole or in part. A few studies (e.g., Walsh et al., 1977; Benninger & Walsh, 1980) have uncovered some relatively minor but noteworthy sex differences, but the majority of studies have found either few sex differences or no appreciable differences (Walsh et al., 1977; Helson, 1978; Salomone & Slaney, 1978; Spokane & Walsh, 1978; Doty & Betz, 1979; Wiggins & Weslander, 1979). Taken together, these studies lend substantial support to the concurrent validity of Holland's theory for men and women employed in the same occupations.

A notable limitation of these studies is that they tend to focus on women employed in traditionally male occupations and give no attention to men employed in traditionally female occupations. With the exception of Prediger and Hanson's (1976) brief treatment of this topic (as noted above), a study by Hecht (1980) is the only study to date to utilize Holland's instrumentation to assess the concurrent validity of his theory for men (and women) pursuing a traditionally female occupation. Although Hecht's subjects were all student nurses whose work histories were not specified, it seems important to conclude this section of the review with a discussion of her findings.

Hecht administered the SDS to 210 entering students at seven baccalaureate degree-granting schools of nursing. The sample included 24 men, 54 blacks (all the men and blacks at the seven institutions), and 25 Ss with prior nurses' training. (Presumably, some of these 25 had experience working as RN's or LPN's.) The percentages of men and blacks in this sample (4% and 10% respectively) were roughly equivalent to the percentages of male and black nursing students nationwide. Although this sample could hardly be considered to be representative of employed nurses, the results
are nonetheless instructive, as this is the first published report of SDS findings with nurses--female or male.

For the sample as a whole, Hecht found substantial support for Holland's (1970, 1977a) SIA coding of this occupation. Thirty-seven percent of the respondents had three-letter codes matching SIA or one of its six permutations, and one of these three letters was the high-point code for 90% of Ss. SIA was the most frequently occurring code, followed closely by SAI, ISA, SIE and SIC. Sixty-two percent of the student nurses were Social types according to the SDS.

No significant race or sex differences were found in SDS codes, congruence, differentiation, or consistency. However, women were more likely than men to have a code beginning with S, and men were more likely than women to have a high-point code of I or R. The only significant sex differences found were in socioeconomic factors pertaining to the career development process: men, compared with women, were older, somewhat lower on the social class scale (a nonsignificant difference), and had spent more time in post-secondary degree programs. Thus, the results of this investigation of men and women pursuing a traditionally female occupation lend additional credence to the following generalization based on the four studies reviewed above, of women and men in traditionally male occupations: while some stereotypical sex differences do exist, they tend, in most (but not all) occupations, to be overshadowed by substantial similarities in men's and women's vocational orientations.

Summing Up: Nontraditional Vocational Choice and Holland's Theory

As Osipow (1983) has stated, "with respect to the research testing it, the record of Holland's theory is extremely good" (p. 112). In the preceding four sections, we have seen how this is true concerning the research
testing the theory's concurrent validity with widely divergent samples of
employed adults. Of the 16 studies of working men, (see Table 1), 5 yielded
mixed results, 11 produced positive results, and none had purely negative
results. Among the 10 studies of working women (Table 2), there were 4
with mixed results, 6 with positive results, and again, none with negative
results. In the 13 studies of mixed samples of working men and women (Table
3), all 13 yielded positive results. Finally, of the 4 studies comparing
working men with working women, 3 had positive results and 1 had mixed re-
results.

Included within these last two categories were nine studies exploring
sex differences in Holland raw scores within various occupations (Table 5).
As noted above, the weight of the evidence from these studies favors the
conclusion that, for most of the occupations thus far investigated, Holland's
theory and its instrumentation have high levels of concurrent validity for
both female and male members of the occupation in question. That is, de-
spite the existence of some stereotypic sex differences, the male and female
members of a given occupation are generally more similar than different in
their vocational orientations. The evidence for this conclusion is found
especially in studies of (1) traditionally male, Enterprising occupations
(Spokane & Walsh, 1978; Doty & Betz, 1979; Benninger & Walsh, 1980); (2)
non-sex-typed Artistic and Social occupations requiring college degrees
(Helson, 1978; Wiggins & Weslander, 1979); (3) traditionally male, profes-
sional-level, Realistic, Investigative and Social occupations (Walsh et al,
1977); and (4) nonprofessional occupations in general (Salamone & Slaney,
1978). In the latter case, the notable exception to the rule is the cate-
gory of traditionally male, Realistic occupations. The available evidence
indicates that in these occupations men and women tend to be more different
than similar, with men having R orientations and women having S and A orientations (Prediger & Hanson, 1976; Salomone & Slaney, 1978; Benninger & Walsh, 1980).

With the exception of Prediger and Hanson (1976), who found I and S orientations among men in traditionally female occupations, and Hecht (1980), who found Holland's theory to be valid for male and female nursing students (despite men tending more toward the I orientation than women and less toward S), no researchers have investigated the concurrent validity of Holland's theory for men employed in traditionally female occupations. From the research reviewed above, however, it would seem reasonable to predict that the vocational orientations of men employed in such occupations would be more similar than different from the orientations of their female counterparts.

Evidence from outside the body of literature concerned with Holland's theory and instrumentation would seem to point to the same conclusion. Hansen (1978), for example, noted that there were few sex differences among SCII-assessed female and male social workers ranging in age from 26 to 55. And Wertheim, Widom & Wortzel (1978), in a study of career choice correlates for male and female graduate students enrolled in traditionally male and traditionally female fields, found that "differences across careers for each variable were greater than differences between the sexes within careers" (p. 234).

In another vein, Wolfe and Betz (1981) found that college women who made nontraditional career choices were significantly more likely to have made choices congruent with their personality type than were women who chose traditional occupations, and furthermore, that masculine-typed women were more likely than others to make nontraditional, congruent career choices.
Three years earlier, Yanico, Hardin and McLaughlin (1978) found women in engineering to be more androgynous than either men in engineering or women in home economics.

If androgyny is indeed a balance between masculine and feminine characteristics (Bem, 1974), involving the ability to be "masculine" or "feminine" depending on the demands of the situation (Bem, 1975), then it is not surprising that Clarey and Sanford (1982) found androgynous women to be far more likely than traditional women to choose nontraditional careers. Taken together, the above three studies (and Bem's definition of androgyny) would seem to suggest that men in nontraditional occupations might also be expected to be androgynous (or, perhaps, feminine-typed), with personalities that are congruent with those of their female counterparts.

Lemkau (1984) has presented evidence that suggests this is indeed the case. Lemkau administered the Bem Sex Role Inventory, the Cattell 16 PF, and a biographical questionnaire to 63 men employed in sex-typical occupations (engineers, foresters, financial officers, etc.) and 54 men employed in nontraditional occupations (physical and occupational therapists, nurses, dieticians, elementary teachers, day care workers, and librarians). The results indicated that nontraditional men, in comparison with traditional men, were less sex-typed (more androgynous), more willing to perform traditionally feminine household tasks, more tender-minded (subjective, kindly, gentle, intuitive), more likely to have been sensitized to their nurturing abilities and emotional sensitivity by family traumas, and more likely to have been socialized away from traditional career choices.

In Holland's terminology, the above findings suggest that men with Social vocational orientations will tend to seek out congruent Social vocational environments (e.g. nursing, elementary teaching or library science).
Thus, men who are employed in traditionally female Social occupations should have vocational orientations that closely match the vocational orientations of their female counterparts. The present investigation is designed to test the validity of this assumption.
CHAPTER III
METHODOLOGY

The main purposes of this study are: (1) to investigate differences between men and women employed in traditionally female occupations, using the Vocational Preference Inventory as a measure of vocational orientation, and (2) to investigate the concurrent validity of Holland's career typology theory for employed, college-degreed adults.

Research Design

Subjects (Ss) were assigned to one of six experimental groups according to sex and occupation (nurse, librarian or primary grades teacher), in a two-factor factorial design.

<table>
<thead>
<tr>
<th>SEX</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nurse</td>
<td>Gp I</td>
<td>Gp II</td>
</tr>
<tr>
<td>Librarian</td>
<td>Gp III</td>
<td>GP IV</td>
</tr>
<tr>
<td>Primary Teacher</td>
<td>Gp V</td>
<td>Gp VI</td>
</tr>
</tbody>
</table>

The three occupations selected for inclusion in this study are all listed in the Occupations Finder (Holland, 1977a) as Social occupations requiring college training. Each of them is a level 5 occupation. Two are coded as SA occupations (Elementary Teacher, SAE; and Librarian, SAI), and one is coded SIA (Nurse, General Duty).
These three occupations were selected because they are, by any standard, all clearly female occupations and are all drawn from the same Holland type. The literature on traditionality contains some useful quantitative guidelines for determining how nontraditional an occupation is for either sex. Using these guidelines, it is apparent that nurse, librarian and primary teacher are clearly nontraditional occupations for men. Cooper (1976) defined an occupation as nontraditional if the number of persons of one's own sex comprising that occupation amounted to less than 24% of the total. Burlin (1976) classified an occupational choice as "innovative" (nontraditional) if less than 30% of one's own sex were members of that occupation, and Hollinger (1983) equated nontraditionality with the figure 29% or less.

According to the most recent available statistics (U.S. Department of Labor, 1980), the percentage of men in the three occupations selected for inclusion in this study are as follows:

- Registered nurses - 3.2%
- Librarians - 19.1%
- Elementary school teachers - 15.7%

The latter figure is, of course, an overestimate for male teachers in the primary grades (K - 4).

Thus, using even the most stringent standard (Cooper's 24%), it is clear that all three of these occupations are nontraditional for men, i.e. they are traditionally "feminine" occupations. This is in keeping with the general consensus of researchers studying sex-typing of occupations.
Shinar (1975), for example, found that occupations stereotypically associated with high levels of interpersonal warmth, passivity and nurturance were viewed as feminine. (And registered nurse, librarian and elementary teacher were among the ten most feminine occupations in the eyes of Shinar's Ss.) Krefting and Berger (1979) noted further that Ss tend to perceive interacting with things (Realistic) as masculine and interacting with people (Social) as feminine, although the same researchers (Krefting, Berger, & Wallace, 1978) also showed that the actual percentage of men or women presently in an occupation is the primary basis upon which jobs are sex-typed in people's minds. (Krefting et al cited librarian, incidentally, as one example of an occupation that is clearly sex-typed as feminine).

Analyzing the 1970 census data, Gottfredson (1978) found that 65.7% of workers employed in Social occupations are women. She concluded that "women are clearly ... over-represented in social jobs" (p. 215). Looking at the same phenomenon from the opposite vantage point, Stockton, Berry, Shepson, and Utz (1980) noted that 70% of employed women work in traditional fields like teaching, nursing and library science. Elementary education, they found, continues to be a nontraditional major for men in college, based on a greater than 3:1 ratio of female-to-male students enrolled in the field. Finally, in a recent article Beyard-Tyler and Haring (1984) used a combination of the above criteria to sort occupations into various categories, including five occupations in the "female/professional" category. Three of those five occupations were librarian, registered nurse and elementary teacher.
Sample

The sample consisted of 151 male and female college-educated workers drawn from three occupations that Holland (1977a) has classified as level 5, Social occupations. All Ss had been employed at least three years in their respective occupations prior to testing, and their participation was voluntarily solicited. With the exception of two male teachers (one from southern Michigan and another from northern Kentucky), Ss were drawn from cities and towns in western and central Ohio, within an area roughly bounded by Toledo, Cincinnati and Columbus.

Group I (male RNs) consisted of 27 male registered nurses with a mean age of 34.4 who had been employed as nurses an average (mean) of 8.0 years. They represented twelve specialty areas within the nursing profession. They had an average of 15.8 years of education. All held the minimum degree required for their profession (the associate degree or its equivalent), and 48% held higher degrees (bachelor's and master's).

Group II (female RNs) consisted of 28 female registered nurses with a mean age of 39.4 who had been employed as nurses an average of 15.0 years. They represented twelve areas of specialization within nursing. They had an average of 15.5 years of education, with all holding at least the associate degree or its equivalent and 36% holding bachelor's and/or master's degrees.

Group III (male librarians) consisted of 24 male librarians whose mean age was 44.2 and whose mean years as a librarian was 13.2. They were employed by school systems (67%), colleges (17%), public libraries (13%), and a corporation (4%). They had an average of 18.3 years of education, holding degrees ranging from the bachelor's to the doctorate (75%
had terminal master's degrees). Group IV (female librarians) consisted of 25 female librarians whose mean age was 45.0 and whose mean years as a librarian was 14.0. They were employed by school systems (52%), colleges (8%), and public libraries (36%). (In addition, one retiree in the sample had worked in all three settings). They had an average of 17.5 years of education, and with the exception of one S who had completed three years of college with no degree, they held degrees ranging from the bachelor's to the master's (72%).

Group V (male teachers) consisted of 24 male elementary teachers whose teaching responsibilities were primarily in grades K through 4. Their average age was 41.3, and they had been employed as teachers an average of 16.5 years. The group included men teaching in all five of the specified grade levels (one kindergarten teacher, three first grade teachers, etc.), as well as two men teaching music and art in grades K-6. They had an average of 17.5 years of education, holding degrees ranging from the bachelor's to the master's (50%). Group VI (female teachers) consisted of 23 female elementary teachers teaching primarily in grades K-4. Their average age was 42.9, and they had been employed as teachers an average of 15.8 years. The group included women teaching in all five of the specified grade levels, as well as nine K-6 teachers working in specialized areas. They had an average of 16.7 years of education; all held at least bachelor's degrees, and 13% held master's degrees.

Overall, questionnaire packets were distributed to 216 volunteer subjects. One hundred and seventy (79%) were returned. Of these, 19 were not included in the analyses for the following reasons: 8 Ss' employment histories did not fit the study's criteria, 8 VPIs were invalid
(mismarked, incomplete or extremely "flat"), and 3 returns were received after the analyses had been completed. Among the remaining 151, the 76 female subjects ranged in age from 23 to 77 (mean 42.3), and the 75 male subjects ranged in age from 26 to 65 (mean 39.7). Female Ss' work experience ranged from 3 to 36 years (mean 14.9), and male Ss' work experience ranged from 3 to 35 years (mean 12.3). All Ss had completed at least two years of college, most (78%) held bachelor's degrees, and many (41%) held advanced degrees. Groups Ns ranged from 23 (female teachers) to 28 (female nurses).

Procedure

Ss for each of the six experimental groups were located through professional/organizational channels and through personal contacts. In most cases, a telephone call requesting their voluntary participation preceeded each S's receipt of the packet of materials, which consisted of a VPI, a Biographical Data Sheet (see Appendix A), a cover letter giving the necessary instructions for completion and return of the instruments (see Appendix B), and a return envelope. For twenty-two of the female teachers and 15 of the female nurses included in the study, the initial introduction to the study was through a modified cover letter (see Appendices C and D) that was included with the instruments when they were "mass distributed" to prospective Ss at their places of employment (for teachers, two elementary schools in Findlay, Ohio, and one in Bluffton, Ohio; for nurses, Bluffton Community Hospital).

The instruments were coded to insure precision in data processing and anonymity for the Ss. Ss understood that their participation was voluntary and that the information they provided would be kept strictly
confidential. They were also offered an opportunity to receive feedback concerning their results.

Instruments

Each S completed the Vocational Preference Inventory (VPI) Holland (1977c), and a brief biodata questionnaire, the Biographical Data Sheet, developed for this study.

The VPI is an interest and personality inventory consisting of a list of 160 occupational titles to which the examinee responds like, indifferent or dislike. The VPI yields scores on eleven scales: Realistic, Intellectual, Social, Conventional, Enterprising, Artistic, Self-Control, Masculinity, Status, Infrequency, and Acquiescence. The first six of these scales are operational definitions of the six occupational types posited by Holland's theory (Holland, 1966, 1973, 1985). These six scales, as well as the Self-Control, Masculinity and Status scales, consist of fourteen non-overlapping items each. The Infrequency scale contains 20 items, the Acquiescence scale 30.

Holland (1978) reports that the development of the VPI was based on the assumption that people tend to perceive occupational titles in stereotyped ways, and that in responding to the occupational titles in the inventory, Ss reveal information about their interests and personality development. Scores on the first six scales are used to assess a person's resemblance to each of the theorized six occupational types of orientations.

The reliability data reported in the VPI Manual (Holland, 1978) suggest that the instrument has moderate to high reliability. In a sample of 6,289 college men, internal consistency coefficients (Kuder Richardson
for the first six scales ranged from .83 to .89. Similar internal consistency data were reported for samples of college women and employed adults. Test-retest reliability data were reported for six separate samples, with time intervals ranging from two weeks to four years. These two-month test-retest coefficients for a sample of 28 adult women (mean age 40.7) are typical: Realistic .57, Intellectual .71, Social .66, Conventional .84, Enterprising .79, Artistic .69.

Studies of the VPI's concurrent and predictive validity have generally been of four types (Walsh, 1973):

1. Investigations of the relationship between VPI scale scores and scores on comparable scales of other personality and interest inventories.

2. Investigations of the VPI's effectiveness in differentiating between various kinds of groups.

3. Investigations of the relationship between VPI scale scores and self-assessments on traits which the various scales are designed to measure.

4. Investigations of the relationship between VPI scale scores and various external criteria, such as supervisors' ratings or occupational status.

The results of these studies, Walsh concludes, generally tend to support the interpretations attributed to the scales and lend some support to the rationale underlying the inventory's development.

Hypotheses

The following hypotheses were formulated on the basis of (1) studies of Holland's theory applied to employed adults (e.g. Benninger & Walsh, 1980; Doty & Betz, 1979; Hecht, 1980; Hener & Meir, 1981; Spokane & Walsh, 1978; Turner & Horn, 1977; Walsh et al, 1977; Walsh et al, 1979; Wiggins, 1982; Wiggins et al, 1983) and (2) the literature dealing with sex as a

**Hypothesis #1.** There are no group differences attributable to occupation on the Social, Artistic, Investigative, Realistic, Conventional or Enterprising scales of the VPI.

**Hypothesis #2.** There are no group differences attributable to sex on the Social, Artistic, Investigative, Realistic, Conventional or Enterprising scales of the VPI.

**Hypothesis #3.** There are no group differences attributable to the interaction of sex and occupation on the Social, Artistic, Investigative, Realistic, Conventional or Enterprising scales of the VPI.

**Hypothesis #4.** There are no group differences attributable to occupation on the Self-Control, Masculinity, Status, Infrequency or Acquiescence scales of VPI.

**Hypothesis #5.** There are no group differences attributable to sex on the Self-Control, Masculinity, Status, Infrequency or Acquiescence scales of the VPI.

**Hypothesis #6.** There are no group differences attributable to the interaction of sex and occupation on the Self-Control, Masculinity, Status, Infrequency or Acquiescence scales of the VPI.

Simply stated, these hypotheses contain the prediction that the men and women employed in these three similarly coded occupations should be more similar than different in the personality characteristics measured by the VPI. The statistical tests used to test these hypotheses included the following. A multivariate analysis of variance (MANOVA) (Winer, 1971)
was performed on the mean scores of all the VPI scales, first for the six vocational scales and then for the five empirical scales. This procedure included a univariate analysis of variance for each scale. Where main effects or interaction effects were found to be significant, a posteriori Tukey tests (Winer, 1971) were used to elucidate these findings.
CHAPTER IV
RESULTS

This chapter will be divided into nine sections. The first section will examine the results for scale discrimination across occupational groups for the vocational orientation scales. The second section will examine the results for scale discrimination across sexes for the vocational orientation scales. The third section will examine sex x occupation interaction effects for the vocational orientation scales. The fourth section will be devoted to the secondary analyses (a posteriori tests) for these same scales. Sections five through eight will repeat this sequence for the analyses of the empirical scales. Finally, section nine will be devoted to an intraoccupational analysis, examining the highest mean scores and three-letter codes for each occupational group by sex.

Scale Discrimination Across Occupational Groups: Vocational Scales

The means, standard deviations and univariate tests of significance for the 11 scales of the VPI are shown in Tables 6 and 7. Concerning the first hypothesis, the multivariate analysis of variance for the main effect of occupation was found to be significant ($F = 2.45, p < .005$). On the other hand, in the univariate analysis for each scale (see Table 7), the test for the main effect of occupation was not found to be significant for any of the six scales; it approached significance, however, with the Enterprising scale ($F = 2.97, p < .06$), suggesting that occupational group differences are largely related to scores on the Enterprising scale.
**TABLE 6**

MEANS AND STANDARD DEVIATIONS FOR THE 11 SCALES OF THE VPI

<table>
<thead>
<tr>
<th></th>
<th>Registered Nurses</th>
<th>Librarians</th>
<th>Primary Teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male (N=27)</td>
<td>Female (N=28)</td>
<td>Male (N=24)</td>
</tr>
<tr>
<td><strong>Realistic</strong></td>
<td>3.30 2.58</td>
<td>1.64 1.75</td>
<td>3.71 3.43</td>
</tr>
<tr>
<td><strong>Investigative</strong></td>
<td>4.85 3.93</td>
<td>5.36 3.85</td>
<td>5.71 4.58</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td>3.63 2.94</td>
<td>5.21 4.02</td>
<td>3.25 3.10</td>
</tr>
<tr>
<td><strong>Conventional</strong></td>
<td>2.37 2.47</td>
<td>2.07 2.36</td>
<td>3.21 3.65</td>
</tr>
<tr>
<td><strong>Enterprising</strong></td>
<td>2.74 2.63</td>
<td>2.86 2.46</td>
<td>4.50 4.00</td>
</tr>
<tr>
<td><strong>Artistic</strong></td>
<td>4.22 3.90</td>
<td>6.46 4.10</td>
<td>5.13 4.33</td>
</tr>
<tr>
<td><strong>Self-Control</strong></td>
<td>10.19 3.75</td>
<td>11.86 2.26</td>
<td>10.04 2.91</td>
</tr>
<tr>
<td><strong>Masculinity</strong></td>
<td>8.56 1.99</td>
<td>6.43 2.06</td>
<td>6.92 2.47</td>
</tr>
<tr>
<td><strong>Status</strong></td>
<td>8.56 2.41</td>
<td>6.96 2.43</td>
<td>8.00 2.45</td>
</tr>
<tr>
<td><strong>Infrequency</strong></td>
<td>6.93 2.91</td>
<td>7.86 2.65</td>
<td>6.63 2.60</td>
</tr>
<tr>
<td><strong>Acquiescence</strong></td>
<td>8.89 3.50</td>
<td>9.50 4.65</td>
<td>10.92 5.07</td>
</tr>
<tr>
<td></td>
<td>Sex</td>
<td>Occupation</td>
<td>Sex x Occupation</td>
</tr>
<tr>
<td>------------------</td>
<td>-------</td>
<td>------------</td>
<td>------------------</td>
</tr>
<tr>
<td>Realistic</td>
<td>25.65***</td>
<td>0.92</td>
<td>0.45</td>
</tr>
<tr>
<td>Investigative</td>
<td>1.90</td>
<td>0.47</td>
<td>1.24</td>
</tr>
<tr>
<td>Social</td>
<td>0.41</td>
<td>1.56</td>
<td>4.08*</td>
</tr>
<tr>
<td>Conventional</td>
<td>2.67</td>
<td>1.54</td>
<td>0.28</td>
</tr>
<tr>
<td>Enterprising</td>
<td>0.22</td>
<td>2.97</td>
<td>0.12</td>
</tr>
<tr>
<td>Artistic</td>
<td>0.68</td>
<td>0.24</td>
<td>3.45*</td>
</tr>
<tr>
<td>Self-Control</td>
<td>4.08*</td>
<td>0.80</td>
<td>0.44</td>
</tr>
<tr>
<td>Masculinity</td>
<td>35.41****</td>
<td>8.94***</td>
<td>0.00</td>
</tr>
<tr>
<td>Status</td>
<td>4.15*</td>
<td>0.13</td>
<td>1.05</td>
</tr>
<tr>
<td>Infrequency</td>
<td>1.10</td>
<td>1.14</td>
<td>0.43</td>
</tr>
<tr>
<td>Acquiescence</td>
<td>5.64*</td>
<td>1.11</td>
<td>2.89</td>
</tr>
</tbody>
</table>

* p < .05  
** P < .01  
*** P < .001  
**** p < .0001
more so than to scores on the other five scales. As Figure 2 shows, the means for the three occupational groups on the six vocational scales are substantially similar, but there is a fairly large discrepancy between nurses and the other two groups on the Enterprising scale (with nurses scoring lower than teachers and librarians), as well as a small, nonsignificant differentiation between groups on the Social (F = 1.56, p < .21) and Conventional (F = 1.54, p < .22) scales. On the whole, then, these results tend to support Hypothesis 1 for five, but not all six, of the vocational orientation scales.

**Scale Discrimination Across Sexes: Vocational Scales**

Concerning the second hypothesis, the MANOVA for the main effect of sex was found to be significant (F = 5.59, p < .0001). In the univariate analysis for each scale (see Table 7), the test for the main effect of sex was found to be significant (highly so) for only the Realistic scale (F = 25.65, p < .0001), indicating that there are very distinct sex differences on the Realistic scale (men scoring higher than women) and only negligible sex differences on the other five scales, as illustrated in Figure 3. As with the previous hypothesis, these results tend to support Hypothesis 2 for five, but not all six, of the vocational orientation scales.

**Interaction Effects: Vocational Scales**

The multivariate test for the interaction effect was not significant (F = 1.29, p < .22). In the univariate analysis, however (see Table 7), significant sex x occupation effects were found for the Social and Artistic scales (p < .02, .04), suggesting that scores for men and women on
FIGURE 2
MEANS FOR VOCATIONAL ORIENTATION SCALES, BY OCCUPATION

FIGURE 3
MEANS FOR VOCATIONAL ORIENTATION SCALES, BY SEX
the Social and Artistic scales may vary differently across the occupations (see Figures 4 and 5). These results tend to support Hypothesis 3 for only four of the six vocational orientation scales.

Secondary Analyses: Vocational Scales

To further clarify the above significant findings and to identify specific group differences (e.g. male teachers compared with female teachers or male teachers compared with male librarians on the Social scale), a secondary analysis, the Tukey (a) "Honestly Significant Difference" procedure (Winer, 1971), was performed on the data (see Table 8). Since it could be argued that a test like the Tukey, which tends to yield fewer significant differences than some other tests, may be too conservative to use in a study which hypothesizes no differences, a more liberal post-hoc test, Fisher's Least Significant Difference procedure (Steel and Torrier, 1980), was also applied to the data. For the sake of comparison, the results obtained with Fisher's test and those obtained with Tukey's are illustrated in Figures 6 - 9.

In the main secondary analysis (Tukey's procedure), significant group differences were found on the Realistic and Social scales, and none were found on the Artistic, Investigative, Enterprising and Conventional scales. On the Realistic scale (see Figure 6) the three male groups ranked first, second and third: male teachers, male librarians and male nurses, respectively. The three female groups (teachers, nurses and librarians, respectively) ranked fourth, fifth and sixth. The male teachers were significantly differentiated from all three female groups, and the male librarians were significantly differentiated from the female librarians. The Fisher test confirmed these four differentiations and
FIGURE 4
SEX X OCCUPATION INTERACTION ON THE SOCIAL SCALE

FIGURE 5
SEX X OCCUPATION INTERACTION ON THE ARTISTIC SCALE
TABLE 8
TUKEY (A) ANALYSES FOR SIGNIFICANT
VOCATIONAL ORIENTATION SCALES

<table>
<thead>
<tr>
<th>Scales</th>
<th>Differentiated Groups (p &lt; .05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>Tm - Tf</td>
</tr>
<tr>
<td></td>
<td>Tm - Nf</td>
</tr>
<tr>
<td></td>
<td>Tm - Lf</td>
</tr>
<tr>
<td></td>
<td>Lm - Lf</td>
</tr>
<tr>
<td>Social</td>
<td>Tm - Lm</td>
</tr>
<tr>
<td>Artistic</td>
<td></td>
</tr>
</tbody>
</table>

Note: T = teachers, N = nurses, L = librarians; m = male, f = female.

suggested four more. According to this test all possible combinations of male and female groups were significantly differentiated from each other except the two middle groups, male nurses and female teachers.

On the Social scale (see Figure 7) male teachers ranked first, followed (respectively) by female nurses, female librarians, female teachers, male nurses and male librarians. According to the Tukey test, only male teachers and male librarians were significantly differentiated. According to the Fisher test, male teachers were significantly differentiated from both of the other male groups (male librarians and male nurses), and male librarians were also differentiated from female nurses.

In the secondary analyses of the Artistic scale, the Tukey test found no significant differentiations and the Fisher test found only one:
Note: T = teachers, N = nurses, L = librarians; m = male, f = female. Groups connected by solid lines were found to be significantly different (p < .05).

FIGURE 6
A POSTERIORI ANALYSES FOR THE REALISTIC SCALE
Note: T = teachers, N = nurses, L = librarians; m = male, f = female. Groups connected by solid lines were found to be significantly different (p < .05).

FIGURE 7
A POSTERIORI ANALYSES FOR THE SOCIAL SCALE
between female nurses, ranking first, and male nurses, ranking last. In the secondary analyses of the Conventional scale, the Tukey test again found no significant differentiations and the Fisher test again found one: between male librarians, ranking first, and female teachers, ranking last. There were no significant group differences found by either procedure on the Investigative and Enterprising scales. On the Investigative scale male librarians ranked first, and on the Enterprising scale male teachers ranked first.

**Scale Discrimination Across Occupational Groups: Empirical Scales**

Concerning the fourth hypothesis, the MANOVA for the main effect of occupation was found to be significant \( (F = 2.09, p < .03) \). In the univariate analysis for each scale (see Table 7), the test for the main effect of occupation was found to be highly significant for the Masculinity scale \( (F = 8.94, p < .0002) \) and was not found to be significant for the other four scales, indicating a distinct difference between occupational groups on this scale, moreso than on the other four scales. These results, then, tend to support Hypothesis 4 for only four of the five empirical scales.

**Scale Discrimination Across Sexes: Empirical Scales**

Concerning the fifth hypothesis, the MANOVA for the main effect of sex was found to be highly significant \( (F = 9.31, p < .0001) \). In the univariate analysis for each scale (see Table 7), the test for the main effect of sex was found to be significant for four of the five scales: Self-Control \( (p < .05) \), Masculinity \( (p < .0001) \), Status \( (p < .05) \), and Acquiescence \( (p < .02) \), indicating clear-cut sex differences across these
Note: T = teachers, N = nurses, L = librarians; m = male, f = female. Groups connected by solid lines were found to be significantly different (p < .05).

FIGURE 8
A POSTERIORI ANALYSES FOR THE ARTISTIC SCALE
Note: T = teachers, N = nurses, L = librarians; m = male, f = female. Groups connected by solid lines were found to be significantly different (p < .05).

FIGURE 9
A POSTERIORI ANALYSES FOR THE CONVENTIONAL SCALE
scales. These results do not support Hypothesis 5.

**Interaction Effects: Empirical Scales**

The multivariate test for the interaction effect was not significant. And in the univariate analysis (see Table 7), no significant sex x occupation effects were found on any of the scales. These results tend to support Hypothesis 6.

**Secondary Analyses: Empirical Scales**

To further clarify the above significant findings and to identify specific group differences, Tukey (a) and Fisher L.S.D. secondary analyses were performed on the data. The results are summarized in Table 9 and in Figures 10 - 13. In the Tukey analysis, significant group differences were found on only the Masculinity and Acquiescence scales; with the Fisher, significant group differences were found on Masculinity, Acquiescence, Status and Self-Control.

On the Masculinity scale (see Figure 10), the three male groups ranked first, second and third: male nurses, male teachers and male librarians, respectively. The three female groups (nurses, teachers and librarians) ranked fourth, fifth and sixth, respectively. According to the Tukey test, group differences occurred strictly along male-female lines: the male nurses were differentiated from all three female groups and the male teacher and male librarian groups were both differentiated from the female teachers and the female librarians. In addition to these, the Fisher test found group differentiations within the two sexes, showing male nurses to be higher on Masculinity than male teachers and librarians and female nurses to be higher on Masculinity than female teachers and
TABLE 9
TUKEY (A) ANALYSES FOR SIGNIFICANT
EMPIRICAL SCALES

<table>
<thead>
<tr>
<th>Scales</th>
<th>Differentiated Groups (p &lt; .05)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Masculinity</td>
<td>Nm - Nf</td>
</tr>
<tr>
<td></td>
<td>Nm - Tf</td>
</tr>
<tr>
<td></td>
<td>Nm - Lf</td>
</tr>
<tr>
<td></td>
<td>Tm - Tf</td>
</tr>
<tr>
<td></td>
<td>Tm - Lf</td>
</tr>
<tr>
<td></td>
<td>Lm - Tf</td>
</tr>
<tr>
<td></td>
<td>Lm - Lf</td>
</tr>
<tr>
<td>Acquiescence</td>
<td>Tm - Lf</td>
</tr>
<tr>
<td>Status</td>
<td>------</td>
</tr>
<tr>
<td>Self-Control</td>
<td>------</td>
</tr>
</tbody>
</table>

Note: T = teachers, N = nurses, L = librarians; m = male, f = female.

On the Acquiescence scale, the male teachers scored noticeably higher than all the other groups: according to Tukey, significantly higher than female librarians (who ranked last), and according to Fisher, significantly higher than all groups except male librarians (who ranked second).

On the Status scale, only the Fisher test found significant differentiations: between male nurses, ranking first, and female nurses, ranking last; and between male teachers, ranking second, and female nurses. On the Self-Control scale, only the Fisher test found a significant differentiation: between female nurses, ranking first, and male teachers,
Tukey H.S.D.

Fisher L.S.D.

Note: T = teachers, N = nurses, L = librarians; m = male, f = female. Groups connected by solid lines were found to be significantly different (p < .05). Groups connected by broken lines were not significantly different on the Fisher test.

FIGURE 10

A POSTERIORI ANALYSES FOR THE MASCULINITY SCALE
Tukey H.S.D.  

Fisher L.S.D.

Note: T = teachers, N = nurses, L = librarians; m = male, f = female. Groups connected by solid lines were found to be significantly different (p < .05).

FIGURE 11
A POSTERIORI ANALYSES FOR THE ACQUIESCENCE SCALE
Tukey H.S.D.

Fisher L.S.D.

Nm
Tm
Lm
Lf
Tf
Nf
Nm
Tm
Lm
Lf
Tf
Nf

Note: T = teachers, N = nurses, L = librarians; m = male, f = female. Groups connected by solid lines were found to be significantly different (p < .05).

FIGURE 12
A POSTERIORI ANALYSES FOR THE STATUS SCALE
Tukey H.S.D.

Nf
Tf
Lf
Nm
Lm
Tm

Fisher L.S.D.

Nf
Tf
Lf
Nm
Lm
Tm

Note: T = teachers, N = nurses, L = librarians; m = male, f = female. Groups connected by solid lines were found to be significantly different (p < .05).

FIGURE 13
A POSTERIORI ANALYSES FOR THE SELF-CONTROL SCALE
ranking last. On the Infrequency scale, where no significant differentiations were found, the female nurses ranked first and the male teachers ranked last.

**Intraoccupational Analysis**

On the basis of an examination of the rank ordering of each group's mean scores on the six vocational scales, three-letter codes for each of the six groups were tabulated. These are reported in Table 10, along with expected codes for the occupational groups (per Holland, 1977a) and Compatibility Indices (CIs) (Wiggins, 1982), showing the degree of congruence between (a) male and female subjects in the same occupation and (b) Holland's expected codes and the codes actually obtained for each of the six groups.

As the table shows, the teachers in this sample (both male and female) obtained their highest mean score on the expected scale, Social. Male teachers had a code of SAI, and female teachers had a code of S/AE (Social was exactly tied with Artistic). These two codes constitute a nearly perfect match with each other and with the expected Holland code, SAE. The similarity between male and female teachers' codes is even more striking when they are noted as six-letter codes: SAIERC for men and S/AEIRC for women.

The next most congruent groups were the male and female nurses. The male nurses' IAS code, the female nurses' AIS code, and the expected SIA code constitute three different arrangements of the same three letters, indicating a fairly high degree of congruence between male and female nurses and a fairly high degree of congruence between expected and obtained codes. A notable finding here is that for both male and female
TABLE 10
THREE-LETTER CODES FOR GROUPS INCLUDED IN THIS STUDY

<table>
<thead>
<tr>
<th>Group</th>
<th>Expected Code (Holland, 1977a)</th>
<th>Obtained Code</th>
<th>Intra-Occupation C.I.</th>
<th>C.I. for Expected vs. Obtained Codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registered Nurses</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>SIA</td>
<td>IAS</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Female</td>
<td>SIA</td>
<td>AIS</td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>Librarians</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>SAI</td>
<td>IAE</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Female</td>
<td>SAI</td>
<td>ASE</td>
<td></td>
<td>5</td>
</tr>
<tr>
<td>Primary Teachers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>SAE</td>
<td>SAI</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Female</td>
<td>SAE</td>
<td>S/AE</td>
<td></td>
<td>8</td>
</tr>
</tbody>
</table>

Note: S = Social, I = Investigative, A = Artistic, E = Enterprising. C.I. = Compatibility Index (Wiggins, 1982), a 0 - 8 scale where 8 represents perfect congruence.

nurses, Social was the third highest scale, not the highest (as Holland would have predicted).

For librarians, the obtained codes were IAE for the male group and ASE for the female group. The AE commonality between the two codes translates into a moderate degree of congruence: 4 on the 0 - 8 CI scale. There was also only moderate congruence between both groups' codes and Holland's expected code (SAI), although the female group was somewhat more congruent than the male group. Social, the expected high-point scale, ranked second in the female librarians' code and fifth for the male
 librarians.

   Overall, among all six groups, the three-letter codes consisted of some combination of S, A, I or E. Across the six groups, mean scores on C and R were always among the lowest two or three scales. In general, this is consistent with Holland's characterizations of the three occupations. Furthermore, within each occupation, the similarities between male and female Ss generally outweighed the differences. This was especially true for the nurses and the teachers.
CHAPTER V
DISCUSSION

This study was designed to explore differences among college-degreed men and women employed in three traditionally female occupations classified as Social occupations by Holland (1977a): registered nurses, librarians, and elementary (K-4) teachers. Holland's Vocational Preference Inventory (VPI) was used to measure vocational orientation and other personality characteristics, and six hypotheses—predicting no differences attributable to sex, occupation or their interaction—were tested.

The Occupation Variable

In the examination of the occupation variable, the findings showed that the Enterprising scale tended to differentiate between nurses and the other two occupational groups, with nurses scoring lower than teachers and librarians. Considering that tendencies toward dominance, risk-taking and upward mobility are components of the personality characteristic that Holland has labelled Enterprising, the finding that nurses seem to be less oriented toward enterprising pursuits begins to make sense. If taking the risk of completing a given amount of education to prepare for or to advance in one's career is taken as an example of an enterprising pursuit, it is clear that the nurses in this sample were less enterprising than the teachers and librarians. Having chosen an occupation that required less educational preparation, the nurses had an average of only 15.62 years of education, compared with 17.92 for librarians and
17.09 for teachers. Thus, it is not surprising that, for the sample as a whole, scores on the Enterprising scale correlated weakly but significantly ($r = .29, p < .003$) with years of education.

The only other scale on which there was significant variation between the occupational groups was the Masculinity scale. The discussion of this scale will be deferred to the following section, since occupation effects on this scale were overshadowed by sex effects. Thus, on 9 of the 11 VPI scales (including 5 of the 6 vocational orientation scales), no significant group differences attributable to occupation were found—indicating that, except for variations between them on the Enterprising and Masculinity scales, the three occupational groups were more similar than different, as predicted.

The Sex Variable

In studying the sex variable across the vocational orientation scales, it was found that, other than a small, nonsignificant sex difference ($F = 2.67, p < .11$) noted on the Conventional scale (men higher than women; see Figures 3 & 9), only the Realistic scale differentiated between the groups; and it did so strictly along male-female lines: male teachers, ranking first, were differentiated from female teachers, nurses and librarians; male librarians, ranking second, were differentiated from female nurses and librarians; and male nurses, ranking third, were differentiated from female nurses and librarians. This finding, of a stronger realistic orientation among men than women, is in harmony with virtually all the research to date on Holland's theory and is therefore not surprising. What is somewhat surprising—or at least noteworthy—is the lack of any clear-cut sex
differences on the other scales where such differences have typically been found: the female Ss were not significantly higher on Social, Artistic and Conventional, nor significantly lower on Investigative and Enterprising. Furthermore, the above-noted realistic tendency among male Ss was not so strong as to overshadow their more occupationally-appropriate social, artistic, investigative and enterprising tendencies: three-letter codes for men were about as vocationally congruent as were the codes for women, and the R theme never occupied a position higher than fourth in the codes of any of the three male groups. On the whole, then, with the exception of variation between them on the Realistic scale, the men and women in this sample were more similar than different in vocational orientation, as predicted.

On the other hand, they were clearly more different than similar on the characteristics measured by the empirical scales. The sex differences found were in the usual directions: women higher than men on Self-Control (passivity, avoidance of danger, etc.), men higher than women on Masculinity (preference for traditional masculine roles), and men higher than women on Status (self-esteem, need for power and prestige). In addition, largely because of the notably high scores of male teachers, men scored higher than women on Acquiescence.

Looking more specifically at the inter-group differentiations, it is worthy of note that female nurses ranked lowest among the six groups on the Status scale, whereas male nurses ranked highest (a statistically significant difference between these two groups). Thus, while male and female nurses appear to be more similar than different in other ways, one clear difference between them seems to be the male nurses' greater
tendency toward upward mobility. This is consistent with the observation spontaneously offered by one of the male nurses in this sample, that men in his profession tend to be more quickly promoted to supervisory positions than women. If this is true, it could be the result of sex role stereotypes being perpetuated within the profession, and/or it might be explained by Barker's (1968) theory of behavior settings: i.e., that when the quantity of people in an environment is relatively small (in this case, few male nurses, relative to female nurses), they are likely to be more vigorously and pervasively involved in that environment (in this case, more committed to their profession).

On the Masculinity scale, the group means were arrayed much as they were on the Realistic scale (male groups higher and female groups lower), and for much the same reason: despite the considerable similarities between the personalities of men and women in this sample, the men tend, nonetheless, to be more "masculine" in their preferences for occupational roles, and the women tend to be more "feminine" in their preferences. This is reflected, for example, in the difference in orientation toward status between male and female nurses, noted above. It is also clearly related to the clear difference between the sexes in preferences for realistic pursuits.

However, to cast this finding in its proper perspective, it is important to note, that according to data provided in the Manual (Holland, 1978), the mean on Masculinity for men in this sample (7.56) is lower than the mean for men in general and is within the high-average range for women in general. The same is true for the mean on Realistic for men in this sample. Thus, this male-female difference needs to be interpreted with caution:
though not as "feminine" as their female counterparts in these traditionally feminine occupations, the males in this sample were also not as "masculine" as their male counterparts in other occupations.

The same caution needs to be exercised in interpreting the effect of the occupation variable on Masculinity scores. Overall, nurses (both male and female), scored higher on Masculinity than teachers and librarians. However, this is not to say that nurses scored high on Masculinity. Actually, their mean score on this scale was only somewhat above average for adults in general, while the means for teachers and librarians were somewhat below average.

In an attempt to shed some light on why nurses should score approximately 1½ points higher on Masculinity than teachers and librarians, the scale itself and some of the research data pertaining to it (Holland, 1978) were examined. The scale is composed of occupational titles that are, for the most part, highly sex-typed in most people's minds (e.g. Professional Athlete-Y; Clothing Designer-N). This being the case, it could certainly be viewed, as Holland (1978) suggests, as a measure of "the degree to which a person has incorporated traditional sex-typing into his thinking about occupations" (p.12). Taking this one step further, it might also be viewed as an indirect measure of personality characteristics that tend to coexist with sex-typed thinking: conventionalism, inflexibility, and the like. It is not surprising, then, that in studies involving such instruments as the 16 PF and the Edwards Personal Preference Schedule, the Masculinity scale has been found to correlate negatively with traits like sociability, deference and intraception, and to correlate positively with emotional stability, dominance, aggression, tough-mindedness, and technical
competency. If these are part of what "Masculinity" is, then it seems clear that nurses are more masculine than teachers and librarians. It would seem that their jobs require them to be somewhat less sociable and intraceptive than teachers, and somewhat less deferent than librarians. Furthermore, they are also required--more so, generally, than teachers and librarians--to be emotionally stable, dominant (in the sense of taking direct responsibility for others' physical welfare), aggressive (afflicting pain when necessary), tough-minded, and competent in technical matters.

The Sex x Occupation Interaction

A few group differences attributable to the interaction of sex and occupation were found on the Social and Artistic scales. The Social scale differentiated between the male teachers, scoring relatively high, and male nurses and librarians, scoring relatively low. The Social scale also differentiated between second-ranked female nurses and sixth-ranked male librarians. The finding that male librarians (a group thought to be social types) scored significantly lower than two other groups on the Social scale is worthy of note. It seems clear that the male librarians in this sample are not social types: the S scale ranked fifth (virtually tied with sixth-ranked C) in this group's six-letter code. On the Artistic scale, the only significant differentiation was between female nurses (scoring highest) and male nurses (scoring lowest). This seems to say more about the female nurses than the male nurses, for Artistic was actually the male nurses' second highest scale. The differentiation between these two groups seems to be largely due to two factors: (1) the male nurses, as a group, had a relatively "flat" profile, with no mean score above 4.85, and (2) the female nurses scored especially high on this
particular scale, higher than any other group on any other scale.

To summarize, then, the following group differentiations were obtained on five of the six vocational orientation scales.

Realistic. The Realistic scale differentiated most of the male groups from most of the female groups, indicating clear-cut sex differences on this scale.

Conventional. According to the more liberal Fisher post-hoc test, this scale differentiated only male librarians from female teachers, suggesting a possible minor sex difference on this scale (in the opposite direction of the sex difference usually found).

Social. The Social scale differentiated four of the groups, with male teachers scoring significantly higher than two other groups and male librarians scoring significantly lower than two other groups. This sex x occupation interaction effect was largely due to the male librarians' low standing on this scale.

Artistic. According to Fisher's test, the Artistic scale differentiated only female nurses from male nurses, highlighting the idiosyncratic profiles of these particular two groups.

Enterprising. A nonsignificant but noticeable occupational difference was found on this scale, i.e. the Enterprising scale tended to differentiate nurses from teachers and librarians.

Thus, although the hypotheses stating that there would be no differences between the groups were only partially supported, the differences found were generally outweighed by the similarities between the groups. On one scale, Realistic, a notable sex difference was found. On another
scale, Investigative, no differences were found. On the Artistic scale, a rather minor sex difference within one occupation was found. On two scales, Social and Conventional, relatively few (four) group differences were found, and most of these (three) were due to the presence of one idiosyncratic group (male librarians) in the sample. Finally, the Enterprising scale tended, as it should, to discriminate between the least enterprising and the more enterprising of the three occupational groups. In short, five of the six vocational orientation scales suggested more similarities than differences, overall, between the six experimental groups.

The Intraoccupational Analysis

The above findings are generally supportive of the concurrent validity of Holland's theory and the VPI, but they do not tell the whole story. Holland's theory suggests that people who work in a given occupation should score higher on that occupation's scale than any other (assuming, of course, that the occupation has been correctly classified in the first place). In this study, two of the groups scored highest on the appropriate scale and four of the groups did not—mixed results, which offer only partial support for Holland's theory. These results will be examined in detail in this section, occupation by occupation.

Teachers. The clearest support for Holland's model came from the results obtained with male and female teachers. The male teachers in this sample scored highest on the appropriate scale (Social) and were coded SAIE, having just a small discrepancy between their code and Holland's (1977a) expected SAE code. Similarly, the female teachers scored highest on Social and Artistic (an exact tie) and were coded S/AEI, also an almost perfect match with the expected code. The male group was especially
high on the Social scale, scoring one to three points higher than every other group.

Within this occupational sample, male and female Ss were highly similar, having codes that matched very closely: SAIERC for men and S/AEIRC for women. On the vocational scales, the only significant difference between them was on the Realistic scale, and even that difference seems fairly negligible, given the rank-ordering of scale scores just noted. Thus, the results obtained with this sample of elementary teachers offer strong support for the concurrent validity of Holland's theory and the VPI.

Nurses. The male nurses in this sample scored third highest on the expected scale. Their three-letter code was IAS, substantially similar to Holland's expected SIA except for the position of the S. Unlike the student nurses in Hecht's (1980) sample, but quite like the male nurses in this sample, the female nurses scored third highest on the Social scale. Their three-letter code was AIS, roughly as congruent with Holland's code as was the code for the male group.

As they pertain to concurrent validity, these results are mixed. The nurses in this sample appear to be IA or AI types, moreso than S types. This offers only modest support for the concurrent validity of Holland's theory and instrumentation, and/or it raises questions concerning his coding of this occupation. In this particular study, these particular nurses do not appear to be social types, but it is impossible to know if this discrepancy from Holland's coding of the occupation is due to sampling error or to defects in the theory or its instrumentation. (It should be noted that the third-ranked S in the female nurses' code was virtually tied with second-ranked I, and that there was a large, 2.4-point gap between S and
fourth-ranked E.

It is difficult to explain why nurses--male or female--should be more artistic in their vocational orientations than social. One could reach back into the history of the VPI and note that in its first edition this scale was called Emotionality (presumably a characteristic of nurses), but it makes more sense to question the representativeness of this sample. To begin with, the sample size is small (27 men, 28 women). Secondly, a large percentage of the female nurses were drawn from one small town hospital and one small town nursing home, and many of these were employed part time. Are these women less representative of nurses in general than those working in big city hospitals or those employed full time? Probably. Might nurses drawn from major metropolitan areas be more socially inclined and less artistically inclined than nurses drawn from Bluffton Community Hospital? Possibly. Thus, the question of whether nurses are, in fact, social types awaits further research with larger, more representative samples.

In the meantime, it is clear that the male and female nurses in this sample were found to be more similar than different in their VPI profiles. According to the Fisher test, they were found to be significantly different on only the Realistic scale (as were men and women within all three occupational groups) and the Artistic scale (due largely to the female group's exceptionally high score on this scale). The two group's three-letter codes, IAS and AIS, matched quite closely--differing only in the ordering of the first two letters.

Librarians. The male librarians scored highest on Investigative, and Social was ranked next-to-last in their code: IAERSC. This code matched
Holland's expected SAI rather poorly. The female librarians scored highest on Artistic and second highest on Social. Their ASEICR code was also not a good match to Holland's code; neither was it a good match to the male librarians' code. These problems with matching centered primarily on the Social and Investigative scales. According to Holland (1977a), librarians should be high on S, A and I, in that order. Both groups were high on A; but the male librarians were high on I and low on S, while the female librarians were high on S and relatively low on I. The only scale found to differentiate between them, however, was the Realistic scale.

These results offer only weak support for the concurrent validity of Holland's theory and provide more questions than they do answers about the correct classification of this occupation. The male librarians in this sample were found to be Investigative-Artistic types, not Social types, and the female librarians were found to be Artistic-Social types. The only characteristics they seem to share are a strong Artistic orientation, a moderate elevation on Enterprising, and a disinclination toward Conventional and Realistic pursuits. Some explanation is needed for why there should be such heterogeneity among librarians and why male librarians, in particular, would have such an idiosyncratic profile. (IAE is a nonexistent category in Holland's classification system.)

For one such explanation, we shall turn to a psychologically sophisticated librarian and educator of librarians, Samuel Rothstein, who earlier this year reviewed the literature on the personalities of librarians in an attempt to explain to himself and to his colleagues why they tend to be so critical of themselves, each other, their profession, and their training institutions. Rothstein (1985) reviewed a rather lengthy laundry list of
personality characteristics common to librarians. Among these are sever­al that call to mind Holland's characterization of the Artistic type: un­disciplined, imaginative, idealistic, sensitive, anxious, easily upset, shy, reserved. Other characteristics included intelligent, deferent, lack­ing self-confidence, conservative, patient, resourceful, and sober.

He then reviewed the findings that show that librarianship was not the first choice of careers for almost 50% of library school students, that librarianship has a low prestige ranking among the professions, that many library school students have a relatively low commitment to the pro­fession, and that self-derogation within the profession sometimes borders on the kind of self-doubt and self-contempt that is commonly found in mi­nority groups. Then, in response to the question, why should librarian­ship attract such people, Rothstein (p.47) concludes

that we are drawn to librarianship (rather late in most cases) because we like libraries and because we are loners or "outsid­ers" temperamentally. The key to both these traits is the fact that we are readers (or used to be).... I am inclined to believe that most people who grow up as readers do so because they feel that they don't fit in with a group.

In short, we are bright people who felt rejected and perhaps had serious doubts about ourselves. We found libraries very pleasant places to be, even refuges. We thought of them as places of employment when other opportunities and fields did not work out. The fact that librarianship was considered a low-sta­tus, undemanding occupation may simply have added to its attrac­tion. Here was one field where we thought that even we could make it!

Despite the over-generalization in this rather dismal, Freudian-sound­ing assessment of librarians, it does shed some light on the questions ar­ticulated above. To begin with, the fact that librarianship may have been (and, in fact, was) the second or third occupational choice of many Ss in this sample, helps to explain why there would be such heterogeneity among
these librarians (discrepant male and female codes and relatively high SDs on some scales) and why the male librarians would have such an improbable composite code: the librarians in this sample are a diverse group with diverse backgrounds. Even among the many who are former teachers, their teaching fields ranged across several Holland environments. (Thirty-five percent had taught, or majored, in fields like English, Art and Music—which helps to explain why the A theme would be so prominent in both groups' codes.) Furthermore, Rothstein's characterization of librarians as social misfits who found refuge with books fits with the finding that the librarians in this sample—especially the men—were not Social types. If Rothstein is correct, many of them were disenchanted historians and biology teachers, who chose librarianship as a less stressful alternative to their previous vocations. Thus, the vocational orientation of librarians and the applicability of Holland's theory to librarians remains somewhat of an enigma, pending further research.

To summarize, in the intraoccupational analysis, men and women within each of the three occupations were generally found to be more similar than different in the personality attributes measured by the VPI. This was especially true for the elementary teachers and registered nurses in the sample. On the key scales comprising each occupation's three-letter Holland code, there was only one statistically significant (though not practically significant) difference found between women and men in the same occupation (male and female nurses on the Artistic scale). The codes obtained by male and female teachers were highly similar; those obtained by female and male nurses were substantially similar; and those obtained by male and female librarians were moderately similar. In general, these results offer mixed
support for the concurrent validity of Holland's theory; strong support for female and male teachers, modest support for male and female nurses, and weak support for female and male librarians.
CHAPTER VI
SUMMARY, CONCLUSIONS, AND LIMITATIONS

This study was designed to: (1) investigate differences between men and women employed in traditionally female occupations, using the Vocational Preference Inventory (VPI) as a measure of vocational orientation, and (2) investigate the concurrent validity of Holland's career typology theory for a sample of employed, college-educated adults. The VPI was administered to 151 men and women employed in three traditionally female professions that Holland (1977a) has classified as Social occupations. All the workers had at least three years of experience in their respective occupations and at least two years of college education.

A multivariate analysis of variance, univariate analyses of variance, and post-hoc Tukey (a) and Fisher LSD tests were used to explore group differences across the 11 scales of the VPI.

Major Findings and Conclusions

Several of the more significant findings and conclusions from this study are enumerated below.

(1) Group differences due to the main effect of occupation were found on the Enterprising and Masculinity scales of the VPI.

(2) Group differences due to the main effect of sex were found on the Realistic, Self-Control, Masculinity, Status, and Acquisience scales.

(3) Group differences due to the interaction of sex and occupation
were found on the Social and Artistic scales.

(4) Overall, the differences found between groups were generally outweighed by the similarities. On the vocational orientation scales in particular, relatively few group differentiations were found, most notably the following:

- The Enterprising scale tended to differentiate the nurses from the other two occupational groups.
- The Realistic scale differentiated most of the six groups according to sex.
- The Social scale differentiated male teachers (scoring high) from the male librarians (low).

Overall, men and women within the same occupation, especially teachers and nurses, were found to be more similar than different in the vocational orientations reflected by their three-letter codes. The men tended not to obtain significantly lower means on the pertinent scales of the VPI:

- The Social, Artistic and Enterprising scales did not differentiate between male and female teachers.
- The Social, Artistic and Investigative scales did not differentiate between female and male librarians.
- The Artistic scale differentiated between male and female nurses, but the Social and Investigative scales did not.

(6) Overall, support for the concurrent validity of Holland's theory was mixed: strong for elementary teachers, moderate for nurses, and weak for librarians.
Limitations

Any generalizations from this study should be made with caution, in light of some obvious limitations. First, only Social occupations were included in the sample. Therefore, generalization to other types does not seem warranted. Second, only three occupational groups were studied. Thus, generalizations to other occupational groups within the Social classification can only be tentative, at best.

Thirdly, the difficulties inherent in sampling from a nontraditional occupation (e.g., availability of subjects) have affected the representativeness of this sample to an unknown extent. Some of the specific problems are as follows. The sample was small and drawn in a non-random fashion from a limited geographic area. Consequently, conclusions drawn from this study relative to the larger population of elementary teachers, nurses, and librarians are necessarily tentative. This is especially true for the latter two occupational groups, with whom representativeness is most in doubt.

In the case of the nurse sample, 79% of the female nurses were drawn from a hospital and nursing home located in the same small town, as was noted in Chapter V. In the case of the librarians, no attempt was made to distinguish between the different types of librarians included in the sample (i.e., among male librarians, 67% school librarians—more accessible to the researcher—and 13% public librarians, vs. 52% and 36%, respectively, for female librarians). The assumption that librarians working in different settings are essentially interchangeable with one another is the same assumption that Holland's classification scheme implies, but if it is a fallacious assumption, it may have influenced this study's results in
unknown ways. The more negative results obtained with librarians and with female nurses should perhaps be tempered with these cautions in mind.

Summary

In conclusion, the results of this study, although mixed, suggest that the vocational orientation scales of the VPI tend not to differentiate between male and female members of the occupations studied. The men and women included in these three occupational samples were found to be more similar than different in the personality characteristics measured by the VPI. This was more true for the elementary teachers and registered nurses than the librarians.
APPENDIXES A - D
APPENDIX A

Code # _______

BIOGRAPHICAL DATA SHEET

Age _______ Sex _____ Occupation ____________________________ (please be specific)

Area of specialization within occupation, if any (e.g., for teachers, grade level taught) ________________________________

Number of years employed in this occupation ______

For teachers, number of years teaching at this grade level ______. Previous grade level taught ______ and number of years ______.

Degree of satisfaction with this occupation (please circle):

1 2 3 4 5 6 7 8 9
Very Dissatisfied Very Satisfied

Previous occupation, if any (most recent if more than one) __________________________. Number of years in that occupation ______.

Father's occupation ____________________________ (please be specific)

Mother's occupation ____________________________ (please be specific)

Education (please circle highest year completed):

9 10 11 12 13 14 15 16 17 18 19 20 ___
High School College or Professional School Graduate School

College: Major(s) ___________ Graduated? yes no Degree(s) ___________ (please circle)

Grad. School: Major(s) ___________ Graduated? yes no Degree(s) ___________ (please circle)

Professional certification(s) and/or license(s) held (please specify):

Would you like to receive written feedback concerning your results on the enclosed Vocational Preference Inventory (VPI)? yes no

Thank you for your participation in this research project. Please feel free to use the reverse side of this sheet for any further comments you might have in relation to the above questions or the VPI.
Dear friend,

Thank you for taking 20 minutes from your busy schedule to participate in my study. By so doing, you are contributing to our understanding of the psychology of vocational choice and to the further refinement of the leading theory that serves as the framework for much of today's vocational counseling. The information that you are providing is, of course, strictly confidential.

On another level, I am personally grateful to you for your assistance. By volunteering to complete these two brief questionnaires, you are making it possible for me to collect the data that I need to complete my doctoral dissertation, and hence, my Ph.D. in counseling psychology. As I go on to pursue a career of helping others through teaching and counseling, your investment of time will have helped to make that possible.

Although I can't repay you financially for your help, I am prepared to offer a return favor. If you would like to receive written feedback, profiling your results on the enclosed vocational interest inventory (the VPI), please circle "yes" at the bottom of the Biographical Data Sheet, and I will send you this information by return mail.

Again, thank you for your investment of time and "interest" in this research project. Please return the two questionnaires to me at your earliest convenience by the means indicated below:

- Mail them to me in the return envelope provided, OR
- Seal them in an envelope with my name on it and return the envelope to the person or location at work from which you originally received them.

Sincerely,

Robert E. Huston, M.A.
Dear friends at Washington Elementary,

Greetings! I hope this letter finds you well and in good spirits as the end of the school year approaches. I know this is a busy time of year for you, but I'm writing to ask if you could spare 20 minutes of your time to do me a favor.

After several years of procrastinating, I'm nearing completion of my doctoral work in counseling psychology at Ohio State, i.e., I'm at the data collection stage with my dissertation. I'm studying patterns of vocational interest among members of different occupational groups, and one of those occupational groups happens to be elementary teachers. That's where you come in, if you care to participate.

If you could take 20 minutes between now and May 20 to fill out the enclosed questionnaires and return them to me (via the school office) in the enclosed envelope, I would greatly appreciate it!

Please note that your participation is entirely voluntary, that the information you're providing is strictly confidential, and that you're entitled to written feedback concerning your "results" on the VPI Interest Inventory. (If you want feedback, just circle "yes" at the bottom of the enclosed Biographical Data Sheet.) Thanks for your help.

Sincerely,

Robert E. Huston, M.A.
Day Treatment Coordinator/
SBII Consultant, Findlay site

Certified as a Mental Health Program by the Ohio Dept. of Mental Health Serving the Counties of Allen, Auglaize, Hancock, Hardin, Mercer, Paulding, Putnam, and Van Wert
Dear friend at Bluffton Community Hospital,

As one member of a helping profession to another, I am writing to ask if you could spare 20 minutes of your time to do me a favor. I'm nearing completion of my doctoral work in counseling psychology at Ohio State, i.e. I'm at the data collection stage with my dissertation. I'm studying patterns of vocational interest among members of different occupational groups, and one of those groups happens to be registered nurses. That's where you come in, if you care to participate.

If you could take 20 minutes between now and May 27 to fill out the enclosed questionnaires and return them to me (via the sealed box in the Nursing Office), I would greatly appreciate it! By so doing, you will be contributing to our understanding of the psychology of vocational choice and to the further refinement of the leading theory that serves as the framework for much of today's vocational counseling.

Please note that your participation is entirely voluntary, that the information you're providing is strictly confidential, and that you're entitled to written feedback concerning your results on the VPI interest inventory. (If you want feedback, just circle "yes" and sign your name at the bottom of the enclosed Biographical Data Sheet, and I will send you a brief interpretation of your results after the "dust has settled" from my dissertation writing.)

Thanks very much for your help!

Sincerely,

Robert E. Huston, M.A.
Mental Health Clinician,
Family Resource Centers
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