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THEORY OF CAREERS WITH NON-PROFESSIONAL WORKING WOMEN

DISSECTATION

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

By
Dorothy Feeney Matthews, A.B., M.A.

* * * * *

The Ohio State University

1977

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Hexagonal Model
The broad topic of this research, the career development of non-college-degreed working women, is shaped by several areas of current concern. The prime social issue involved is the changing status of women. Van Dusen and Sheldon (1976) cite the diminishing importance in the United States of the social distinction between married and unmarried women with accompanying changes toward more education, later and more impermanent marriage, later and fewer childbirths, and more participation in the labor market. Blake's (1974) interesting analysis of the position of women in Western developed countries essentially concurs, with some contrasting tendencies noted toward earlier marriage. Blake views change in terms of the effects on women's derived status of such variables as the Industrial Revolution and World War II, the supplanting of hereditary acquired status by achievement status among men, the promotion by various women's movements of an opportunity for women to have independent status without sacrificing family life, a decreasing birth rate since 1860, an increasing
demand for workers in "female" occupations, and patterns of socialization teaching both boys and girls that a woman's primary place is as a wife and mother no matter what she may do on a secondary level. For whatever reasons, then, the lives of women are changing, and the attention of the world has been focused on that fact by the designation of 1975 as International Women's Year by the United Nations General Assembly (U. S. Department of Labor, 1975).

In the United States, discussions of feminism have been widely disseminated by the popular media making the fact of some women's discontent with past and present status a matter of public record. Politically-inspired institutional involvements -- highlighted by President Kennedy's 1963 establishment of the Commission on the Status of Women, passage of the Equal Rights Amendment by Congress in 1972 and President Ford's underlining of International Women's Year via Executive Order 11832 in 1975 -- reflect new concern for a responsive social view of women. Such concern is especially evidenced by the fact that an equal rights amendment has been introduced at every session of Congress since 1923 (Bem and Bem, 1974). The continued strength of more traditional views of women is likewise evidenced by opposition to the ERA sufficient to prevent its ratification to date.

Social change and pressure for change has been especially apparent in job-related areas. One possible explanation is that change in legal structure and application has concentrated
initially on sex discrimination in terms of equal pay for equal work (The Equal Pay Act of 1963 and Education Amendments of 1972) and equal jobs (Title VII of the 1964 Civil Rights Act and its amendment, the 1972 Equal Employment Opportunity Act). The fact of differences in employment based on sex is indicated by Haughten (1973) in an Equal Employment Commission report based on data from larger businesses in 17 metropolitan areas. A striking similarity between women and minorities is reported in their under-representation in the higher-paying, more prestigious jobs and over-representation in the lower-paying, menial-type jobs. Such information is confirmed by many others (The President's Commission on the Status of Women, 1963; Women's Bureau, 1971 and 1973; U. S. Department of Labor, 1975).

A corollary to legal changes is the quiet move of women into the labor market. The U. S. Department of Labor reported in July, 1976, that there were 30.3 million civilian employed females over age 20 in 1975. This figure reflects the rise in unemployment since 1974 that has affected both men and women, but that has affected especially women and minority groups (U. S. Department of Labor, 1975). The Women's Bureau reported in 1973 that there were more than 33 million civilian women workers over age 16 in 1972. This was an increase over the 1970 report of 30.5 million women workers in 1969 and 29.2 in 1968. The amount of the labor force comprised by women has increased from 20% in
1920 (Women's Bureau, 1973) to 44.7% in 1973 (U. S. Department of Labor, 1975). Approximately nine out of ten girls will work at some time during their lives (Women's Bureau, 1971). So despite fluctuations in the economy, the trend of increased labor force participation for women is evident. While this trend is difficult to interpret from such figures in themselves, in combination with the facts that the divorce rate is increasing (Fitzgerald, 1973), birthrate has dropped, marriage is occurring at a later age, and opportunities for women in both education and employment have expanded (Westervelt, 1973), it appears that many women are re-thinking the question, "what are you going to do when you grow up?"

As a direct result of these trends, an area of current concern to counseling professionals is the relative lack of theory and directly relevant research on the development of women's careers. As long ago as 1951, Tyler pointed out that girls are socialized primarily according to a sex-role model while boys' socialization begins with a sex model, then shifts to a differentiated occupational model. Similarly, Anastasi (1966) has suggested that the two sexes represent two distinct subcultures. Klemmack and Edwards (1973) see changes in the current mode of aspirations for college women moving toward desire for role expansion to include both work and marriage. Statistics indicate that the shape of a typical women's involvement in the labor force differs from that of a man, for whatever reasons
the extent of women's participation in the labor force by age group indicates that a high proportion of women are employed in the early working years; then there is a marked decrease during the child-bearing, childrearing years; followed by a progressive increase in each age category thereafter until age 55 or 60.

The two periods when women are most likely to work are during ages 20 through 24 and 45 through 54. (Women's Bureau, 1971)

Planning for or against such a career presents problems because each woman is uncertain concerning the timing (or occurrence) of marriage and children, others' attitudes toward her working, financial needs, geographic location, and other factors. Men can plan more easily than women perhaps due to this perception of more uncertainty in women's futures and due to social strictures that prevent most men from considering staying at home with the children as a viable alternative. Women are often expected to subordinate their occupations to family responsibilities, whereas for many men their occupations primarily fulfill their family responsibilities. The consequent tentativeness of women along with possible differences in the centrality of work to the identities of men and women constitute major differences in the career development of men and women which render masculine-based theories and tests possibly inadequate in the vocational counseling of women (Osipow, 1968; Resnikoff, 1969).

Further, an important point that many have realized implicitly is demonstrated by Rose and Elton (1971). Male and female
college seniors whose majors were classified according to Holland's occupational categories, one of many theories of career development, were given the Omnibus Personality Inventory. Results indicated that occupational groups were significantly different, that groups by sex were significantly different, and that the interaction of category and sex was also significant so that, for example, Investigative males were different from Investigative females. The important point is that since males and females differ in terms of personality (Doherty, 1974), since some theories of career development are based on personality, and since society has approached men's and women's careers differently, males and females may require different theories or different theoretical interpretations. Thus, the influx of working women, the legitimation of demands for vocational equality via the legal system, the relatively undeveloped nature of theories of women's career development (Vetter, 1973), and the problem of appropriate vocational materials and interventions (Schlossberg and Pietrofesa, 1973; Vetter, 1974; Holland, 1974a) all create a crisis in vocational knowledge about and counseling of women (see The Counseling Psychologist, Vol. 4, No. 1, 1973; Holland, 1974b).

Professional concerns about sex bias in vocational services have sparked involvement by such groups as the National Science Foundation, the National Institute of Education (Crump, 1974; Diamond, 1975), the Association for Measurement and Evaluation

Beyond the theory and research needs of the field of women's vocational planning lies the additional professional concern for the validity and appropriate application of existing vocational literature to the extent that it has been developed using college students as subjects, possibly without adequate follow-up (Osipow, 1968). The non-college-degreed employed sample seems all but neglected, especially in terms that can be related back to high school and junior high school vocational counseling. The additional modifier of "non-college-degreed" to "employed subject" further limits the amount of research available (Fishburne, 1973; O'Brien and Walsh, 1976). The fact that a person's educational level at job entry is important in vocational counseling is self-evident. That it may have implications for
vocational theory is attested to by several facts. A notable program in vocational research, Super's Career Pattern survey, investigated the relationship of a large number of variables to vocational, career, and educational criteria following ninth-grade males over a ten-year period. One result was that conventional school variables and especially parental socioeconomic level maintained predictive validity and, thus, are important factors in vocational development (Super, 1969). Educational level and socioeconomic status, and some would include sex-role ideology (Gaskell, 1975; Sibbison and Peters, 1975), are known to be correlated and relevant to occupations (Tiedeman, O'Hara and Matthews, 1958; Matthews and Tiedeman, 1964; Reiss, 1961; Gross, 1964; Blau and Duncan, 1967). So in dealing with women's career development it becomes important to look directly at an especially neglected segment of the population -- the non-college-degreed employed female subject -- and to tie existing theory, which is usually built upon student aspirations, to the reality of occupational choices evidenced by actual participation in a particular occupation. This study aims to investigate such a sample of women in terms of Holland's theory of career development.
CHAPTER II

RELATED LITERATURE

This chapter will begin with an explication of Holland's theory and then turn to research pertaining to the validity of that theory. Holland's ideas will be treated as a theory in this paper despite Carkhuff, Alexik and Anderson's (1967) carefully constructed view that Holland's work, among most others', fails to meet established criteria of theory building (cf. Isaacson, 1967). Research relating more specifically to women and employed samples will be noted. Finally, an overview of this study will be included.

HOLLAND'S THEORY

Osipow (1968) describes four approaches to career counseling -- trait-factor theories involving matching of job requirements with personal characteristics; sociological theories stressing impersonal, social determinants of occupation; self-concept theories, which view on-going vocational behavior as a developing implementation of one's self-concept; and personality theories
assuming that occupational participation depends upon the extent to which an occupation satisfies personal needs. Holland's career typology belongs to the latter group of theories.

Crites (1969) also discusses different kinds of vocational theories, including developmental, deductive, inductive, and functional, with Holland's theory exemplifying the functional since it has "continually moved back and forth between the theory- and data-language levels in the process of developing and testing hypotheses."

This is an apt description because since its inception in 1959, Holland's theory of careers has been developed through succeeding revisions (1962, 1973). Initially based on Holland's clinical experience (Osipow, 1968), the entire theory, both personality and environmental components, assumes Lewin's idea that human behavior is a function of both the individual's personality and the environment in which he lives (Walsh, 1973). The theory deals with vocational interests treated as personality variables and with self-rated competencies. It does not enter the realm of actual aptitude or achievement. Holland takes the position, perhaps unique in vocational counseling (Osipow, 1968), that a person's occupational stereotypes have psychological meaning and can be used constructively in helping him to plan. Further, such stereotypes are generally valid so that people who work in similar occupations are similar in personality, history, interpersonal
style and interaction with the environment (Holland, 1973).

Briefly stated, Holland proposes that vocational behavior is an aspect of an individual's personality and that personality, as well as environment (with respect to vocational behavior) can be described via a six-category typology -- Realistic, Investigative, Artistic, Social, Enterprising, and Conventional. Persons of a given type would tend to enter occupations (or school programs, etc.) and, therefore, environments of the same or similar type in order to maximize their satisfactions, that is, exercise their skills and abilities, express their attitudes and values, and take on agreeable problems and roles (Holland, 1973).

These types are described more fully by the following statements condensed from Holland's most complete theoretical statement (1973):

**Realistic**

**Personality** -- characterized by preferences for tasks involving the explicit, ordered, or systematic manipulation of objects, tools, machines, animals; by dislike of educational or therapeutic activities; and by the tendency to acquire manual, mechanical, agricultural, electrical, and technical competencies and not to acquire social and educational competencies. **Environment** -- dominated by tasks involving the explicit, ordered, or systematic manipulation of objects, tools, machines and animals, and by people of the Realistic personality type.

**Investigative**

**Personality** -- characterized by preferences for tasks involving the observational, symbolic, systematic, and creative investigation of physical, biological, and cultural phenomena with goals of understanding and control; by dislike of persuasive, social, and
repetitive activities; and by the tendency to acquire scientific and mathematical competencies and not to acquire persuasive competencies.

Environment -- dominated by tasks involving the observation and symbolic, systematic, creative investigation of physical, biological, or cultural phenomena and by people of the Investigative personality type.

Artistic

Personality -- characterized by preferences for tasks involving ambiguous, free, unsystematized manipulation of physical, verbal, or human materials to create art forms or products; by dislike of explicit, ordered tasks; and by the tendency to acquire artistic competencies (art, language, music, drama, writing) and not to acquire clerical or business competencies. Environment -- dominated by ambiguous, free, unsystematized tasks and by people of the Artistic personality type.

Social

Personality -- characterized by preferences for tasks involving manipulation of others to inform, train, develop, cure, or enlighten; by dislike of ordered, systematic tasks involving materials, tools, or machines; and by the tendency to acquire human relations competencies and not to acquire manual and technical competencies. Environment -- dominated by tasks involving manipulation of others to inform, train, develop, cure, or enlighten and by people of the Social personality type.

Enterprising

Personality -- characterized by preferences for tasks that involve the manipulation of others to attain organizational goals or economic gain; by dislike of observational, symbolic, and systematic tasks; and by the tendency to acquire leadership, interpersonal and persuasive competencies and not to acquire scientific competencies. Environment -- dominated by tasks involving manipulation of others to attain organizational or self-interest goals, and by people of the Enterprising personality type.
Conventional
Personality -- characterized by preferences for tasks involving explicit, ordered, systematic manipulation of data, such as record-keeping, material filing or reproduction, planned data organization, or business machine operation, for organizational or economic goals; by a dislike of ambiguous, free, exploratory or unsystematic tasks; and by the tendency to acquire clerical, computational and business competencies and not to acquire artistic competencies.

Environment -- dominated by tasks involving explicit, ordered, systematic manipulation of data, such as records or files, and/or the use of business machines, and by people of the Conventional personality type.

In addition to considering which single type an individual or environment most resembles, one can look at patterns of resemblance to several types, thus sharpening description. Holland speaks of such patterns as subtypes.

The typological constructs can be operationalized via several measures. Personality type or subtype is usually determined using the Vocational Preference Inventory (VPI) (Holland, 1965) or the Self-Directed Search (SDS) (Holland, 1971a, 1971b). Both of these yield a profile of scores which rank measures of the six types from highest to lowest. For example, a person who receives a profile of RCIAS most resembles the Realistic type and least resembles the Social type. Another instrument which yields both measures of Holland's six personality types and the usual Strong Vocational Interest Blank (SVIB) data are the Holland Scales (Campbell and Holland, 1972; Matteson, et al., 1973), which represent an amalgamation of these two vocational research
approaches. Holland (1973) also provides a rationale for determining the six types from the Kuder Preference Record, major field of study, and choice of vocation.

Environmental type can be determined on a broad scale by employing the Environmental Assessment Technique (EAT) (Astin and Holland, 1961). It, too, yields a profile of six scores for a given environment. The Occupations Finder (Holland, 1974), a supplement to the SDS, classifies most common occupations according to their three highest types. For example, Fish and Game Warden is classified as RES -- most like the Realistic type, next like the Enterprising type, and next like the Social type. The other three types are presumed to bear little relation to this occupational environment. Finally, Viernstein (1972) prepared a method by which the Holland environmental typology could be extended to the entire Dictionary of Occupational Titles. When it is known that a person works at a particular occupation, the three-letter code for that occupation also theoretically describes that individual's personality subtype. This reveals the circularity in the typological determinations in that the type of the environment is dependent on the type of the majority of the individuals aggregated within that environment.

Beyond the four basic assumptions mentioned above -- personality types, environmental types, the seeking of people for compatible environments, and the outcome of behavior as an interaction
of personality and environment -- Holland proposes three additional concepts based on an empirically-derived hexagonal model. This model geometrically defines relationships among the six types so that types occurring adjacent to one another are the most similar (Investigative and Artistic, for example) while types occurring opposite one another are the least similar (Realistic and Social). A shorthand expression for the model is RIASEC, understanding that C and R connect to complete the relationship (see Figure 1).

![Hexagonal Model](image)

**Figure 1. Hexagonal Model (Holland, et al., 1969)**

One supplementary concept utilizing the model is congruence, or the compatibility of the person with his environment. Four levels of congruence can be obtained from the model using one-letter codes. The highest compatibility exists when a person functions within a matching environment (E-E, for example). Such a combination would be called congruent. The least compatibility
exists between a person whose type is opposite his environmental type on the model (E-I). This combination is incongruent. Congruence implies a matching of an individual's preferences with the demands of his environment, while incongruence implies a conflict.

Another supplementary concept is consistency, or the degree of similarity between the highest two types within a personality or environmental code. This concept is operationally defined by adjacency in the hexagonal model, so that a personality or environmental subtype with the highest two code letters adjacent on the hexagonal model is called consistent (ES). If the two highest letters are opposite each other on the model, then they are dissimilar, and that subtype is considered inconsistent. Consistency exists in three levels -- high, middle, low -- which are derivable from the model. Holland (1973) also provides a listing of all possible pairs. Consistency, then, implies a singleness of purpose within a person or environment, while inconsistency implies conflicting goals.

The final concept is differentiation or homogeneity, a numerical score equalling the absolute difference between highest and lowest scores on the six types. If the differentiation score is small, then the personality or environmental subtype shows a relatively equal presence of the six types and is called undifferentiated. A graph of such a subtype would be flat. It the differentiation score is high, then some types are more
well-represented than others in a personality or environmental subtype, and the graph will have peaks and valleys. Such a well-defined subtype is considered differentiated. Differentiation implies definite preferences, the desirability of some tasks or rewards and the undesirability of others. Undifferentiation implies a lack of such choosing for many possible reasons.

Holland (1973a) summarizes the proposed interaction of these concepts as follows:

Interactions involving different degrees of congruence, consistency, and differentiation will result in different kinds and degrees of outcomes. At one extreme, the interaction of a type and model environment that are congruent, consistent, and differentiated will intensify and make more predictable the hypotheses about vocational life, personal effectiveness, educational behavior, social behavior, and environmental responsiveness. . . . At the other extreme, incongruence, inconsistency, and undifferentiation make for uncertain predictions and outcomes: unpredictable vocational behavior, dissatisfaction, and ineffective functioning.

The relative influence or importance of these characteristics seems to be as follows: Congruence of the person-environment interaction is most influential; differentiation of person or environment is next, and consistency of person or environment is least influential. [pp. 39-40]

The particular importance of person-environment congruence is evidenced by Holland's (1966) predictions of correlated personal outcomes

(1) more stable vocational choice
(2) higher vocational achievement
(3) higher academic achievement
(4) better maintenance of personal stability
(5) greater satisfaction. [p. 73]
RESEARCH ON THE VALIDITY OF HOLLAND'S THEORY

Introduction

Both initial studies and a great deal of later evidence tend to support Holland's proposals, particularly with respect to college male samples. Despite inclusion of female subjects in many studies of Holland's theory, how the theory relates specifically to women was ignored until recently. In his 1966b presentation of the theory, Holland does make explicit his position at that time:

Unfortunately most of our empirical knowledge about personality and vocational behavior has been obtained in studies of men. Consequently, it is difficult to construct a theory of personality that applies equally to men and to women. The present theory is no exception: it is chiefly based on studies of men and is probably less useful for understanding the behavior of women. A special but closely related theory for women is desirable, but at this point I have none to offer. [p. 13]

A beginning attempt was made in 1968, however, when Holland and Whitney used a seven-category typology -- Intellectual, Social-Intellectual, Social-Conventional, Social-Enterprising, Social-Artistic, Conventional, and Artistic -- to study the vocational choices of 1571 female college freshmen for eight or 12 months. They found that 84% of the women selected an occupation in the same major class on both occasions, with only 69% of the 1576 college men in the sample scoring similarly. This altered typology reflects the pervasiveness of typical "female" vocations
found mostly in Social, Conventional, and Artistic types, the
difficulty of isolating "Social" and "Artistic" types for women,
and the relative absence of Realistic occupations among typical
research respondents. Describing this new typology, Holland (1968)
stated that it yields a more equal distribution of women among
types than the original typology. However, the predictive va-
lidity remained ambiguous, the Social and Conventional types
(traditional female jobs) were again the most stable, and tests
of consistency and homogeneity (differentiation) yielded no sta-
tistical significance. He explored such explanations as the poss-
sibilities that women are more flexible than men due to a per-
ceived role of doing what needs to be done, that exposure to
male-dominated occupational environments results in developmental
conflict in women with what is learned from female models, and
that stability may be less dependent on interests for women than
for men so that the relationship of homogeneity to stability and
satisfaction may be more complex or nonexistent for women. At this
point, additional revision seemed in order.

In 1974, however, Holland seems to have decided that dif-
ferences do exist in how men and women approach vocations and
vocational choice but that these differences should be reflected
in different anticipated scoring patterns on interest inventories.
In partial response to the currently popular attack that interest
inventories are biased against women, he seems to have moved more
toward the position that revision may not be needed until it is specifically indicated by research. Responsibility for opening avenues of vocational choice, providing auxiliary materials, and aiding self-exploration ultimately lies more with the counselor and how he or she uses inventories than within the inventories themselves. It is a societal problem that men and women score differently on the same inventory. Holland (1974d) summarizes his present position, saying

> equal treatment [single form] of an inventory does not lead to identical outcomes. Consequently, the best possible outcomes we can hope for are different but equally useful outcomes for men and women. [p.28]

Holland has reiterated and explained this position often (Holland, 1973b, 1974b, 1974c, 1976; Gottfredson and Holland, 1975) and cites for support the research of Redmond (1972) and Holland (1974d) indicating an increase in the number of vocational alternatives considered by both males and females after taking the SDS.

**Basic Assumptions**

Holland's theory assumes a number of relationships, some of which find support in the literature.

Several assumptions underlie the VPI and the SDS. A major one, that occupational stereotypes are both valid and stable, is backed by several studies (O'Dowd and Beardslee, 1960, 1967; Banducci, 1968; Holland, 1963-64; Hollander and Parker, 1969). Of especial interest is a replication of Holland's 1963-64 results
on National Merit Scholars by Westbrook and Molla (1976) on college freshmen. They found a high degree of similarity between the way males and females viewed six kinds of workers, one representing each of Holland's six occupational environments. Unique stereotypes were valid and reliable for each occupational type. Some counter evidence that occupational stereotypes are reliable but not valid is supplied by Elmendorf (1973). Male college students (N=161) answered the VPI as themselves (personal responses) or as a member of one of three occupations (stereotypic responses). Ss' personal responses were distinct from stereotypic responses, and each of the three groups of stereotypic responses was distinct. This indicated the existence of specific occupational stereotypes. Ss' stereotypic responses were then compared to personal responses to the VPI of three groups of individuals actually employed in the occupations in question. In each case, students' stereotypes were distinct from responses of those working in that occupation. Responses of the three criterion groups were also distinct. This result questions the validity of the students' stereotypes.

Two other assumptions basic to Holland's inventories involve the relationships between vocational interests and vocational preferences and avocational activities. According to test instructions, both the VPI and the SDS assume that if one indicates interest in a vocation, he also prefers it. Tyler (1964) discusses
the idea that an interest test measures the direction of a person's interests but not their strength. Ziegler (1969) investigated Super's vocational self-concept theory with college males. After finding an interesting but not clearly enunciated distinction between vocational preference and vocational interest, he concluded that vocational preference might best be seen as a joint function of both self-concept and vocational interest. Some of the differences here may be attributable to semantics, but it seems that some caution is warranted in assuming the identity of interests and preferences. Finally, one study casts doubt on the SDS assumption that some non-vocational interests (like reading popular fiction or attending social clubs) have, as aspects of an individual's personal orientation, relevance for vocational preferences.

Rezler (1967) performed a correlation study on VPI and Kuder scores and biographical information from high school girls. Among other results she found that avocational pursuits had no significance for vocational goals. Interpretation of this idea is limited by characteristics of correlational analysis with ipsative data (Clemans, 1968).

Relationship of Preferences to Jobs. Another hypothesis underlying Holland's theory is that inventoried vocational preferences actually relate to later jobs. The relationship of inventoried interests to expressed interests will be discussed in another section. Generally, there is a positive correlation and
expressed interest (or vocational aspiration) appears to be a better predictor of subsequent employment than inventoried interest. Gottfredson and Holland (1975) cite three studies supporting the idea that the vocational choices of college students relate to later employment (Dyer, 1932; Sharp and Krasnegor, 1966; Strong, 1953). Of special significance is Strong's (1955) classic 18-year follow-up of 633 Stanford Ss who took the SVIB in 1927-1930 while in college. Predictive validity was supported by results indicating 88 chances in 100 that a student who had scored 55 or higher on an occupational scale would be employed in that occupation, while only 17 chances existed in 100 that a student scoring below 30 would be employed in that occupation. Although these outcomes cannot be automatically generalized to Holland's work, they do accrue some power for inventoried interests.

**Congruence.** The basis for the congruence hypothesis, a more sophisticated statement of the principle that "likes attract," gains credence from research indicating that students are attracted to students like themselves (Holland, 1964), that students expect to like others whose interests are similar (Hogan, Hall and Blank, 1971), that people seek environments in which they are interested and for which they possess aptitude (Holland and Nichols, 1964), and that students prefer college subcultures compatible with their personalities (Apostal, 1970). All of these studies obtained similar results for men and women except the
Holland (1964) study which yielded $p < .001$ significance for men and $p < .10$ significance for women.

A few studies relate to the idea that the environment developmentally shapes occupationally-relevant aspects of personality. Grandy and Stahmann (1974) found relationships between the Holland types of father-son, father-daughter, and mother-daughter family pairs. Results both from male and female college freshmen reporting changes in preferred major since coming to college (Walsh, Vaudrin, and Hummel, 1972) and from comparison of male and female seniors and freshmen reporting the same major (Walsh and Lacey, 1969, 1970) indicate that the amount of association with a specific environment effects an enhancement of personality characteristics. Elton (1970) examined personality changes over two years in males who changed majors. In Holland terms, changes were in the expected directions. These data supporting a developmental conception of congruence are challenged by other studies. Elton and Rose (1970) took a further look at males who change majors and found that immigrants do fit better with the new group than with the old one in terms of personality, but that group identity is mainly formed by persisters. Immigrants seem to make their final occupational choice on an ability rather than a personality basis and were found to add to the homogeneity of the new group but not to add to the heterogeneity of all groups. A massive study of over 4,000 male and female students from 62 two-year colleges
provides persuasive evidence. Scott, Fenske and Maxey (1974) administered the American College Testing Program's Career Planning Profile in 1970 and the Career Planning Profile Follow-up Questionnaire to the same Ss in 1972. Those who changed vocational choice over the two years differed very little from non-changers in terms of the 23 interest, ability, and family background variables examined. This result does not support a developmental view of congruence. Finally, Andrews (1973, 1975) found that adult males who are part-time students have a significant tendency to move toward future jobs that are more congruent with present VPI scores than are their present jobs. Given that individuals tend to move toward person-environment congruence, a testable statement in itself that has accrued some support, the question here seems to revolve around how much of the variance of that movement can be explained by saying that likes attract.

Relationship of Interests and Personality. A final assumption -- that interest is related to, if not a special class of, personality -- has intrigued thinkers other than Holland. Crites (1969) reports, however, that although it is tempting to relate these two constructs, the coefficients are similar to those between aptitudes and interests, around ±.20 with an occasional one as high as .40. Similarly, but with an important difference, Super and Crites (1962) conclude that personality adjustment in the sense of feelings of adequacy and security has not been
shown to be related to interest patterns, but social adjustment does appear to be related. That social adjustment and vocational interests relate is the basis of Roe's (1956) theory of career development which, like Holland's, is considered a personality-oriented vocational theory (Osipow, 1968). It is, therefore, of interest here that Roe's circular ordering of interest groups (1956) is almost identical to Holland's hexagonal model (Holland, 1973a).

Some research has been done that supports Holland's assumption of interests as personality variables; how these findings relate to Super and Crites' statement is unclear although much depends upon the particular measures used in research. An important early study is Holland's 1960 intercorrelation of the VPI with the Cattell Sixteen Personality Factor Questionnaire (16 PF). A sample of 1177 National Merit Scholars yielded support for the construct validity of the VPI, with 47% of the correlations significant. Holland concludes that the many relationships between personality variables and occupational classes support the idea that occupational preferences communicate both vocationally- and personality-relevant information. This conclusion is confirmed and expanded in a later, more comprehensive study by Baird (1970) using a sample of 11,249 men and 9,120 women obtained from 37 diverse colleges. Canonical correlations were performed on VPI scores, self-ratings, competence scales, and other measures. The
highest correlations were obtained between the VPI and non-academic achievement variables, and moderate relationships were noted between the VPI and life goals and personality traits. Further support for the relationship of personality to vocational preferences accrues from the work of other researchers (Dunteman and Bailey, 1967; Kelso, 1969; Bohn, 1966; Thorndike, et al., 1968; Folsom, 1969; Patterson, Marron and Patterson, 1971; Williams, 1972; Banikotes and McCabe, 1972; Holland and Nafziger, 1975; and Alston, et al., 1976; cf. Folsom, 1971; Foster, 1971; Thomas, 1971; Navran and Kendall, 1971; Salomone and Muthard, 1972). Yonge and Regan (1975) present mixed results. Most of the studies in this section were not oriented toward sex differences and do not report important sex differences (see Rose and Elton, 1971, and Yonge and Regan, 1975). The Alston, et al. (1976) research found that sex differences in personality were not reflected by the SDS via an adjective check list constructed from Holland's theoretical descriptions of types. Most of these studies also provide evidence for the validity of Holland's six typological constructs.

**TYPOLOGICAL CONSTRUCTS**

In general it is difficult to separate the validation of Holland's types from the construction and validation of his rather a priori means of measuring the types -- the Vocational Preference Inventory, the Self-Directed Search, the Environmental Assessment
Technique, and the Occupations Finder (Holland, 1973a, 1974a) -- and the Strong-Holland Scales (Campbell and Holland, 1972; Matteson, et al., 1973). In addition, some studies have determined Holland types from college major and from present or desired occupation (Holland, 1973a).

Validation

A number of early studies by Holland's group accomplish initial validation of the typological constructs. This research is complex, utilizing multiple measures and criteria, and assessing varying kinds of outcomes. It is limited by exclusive sampling from an unusually talented college population, National Merit Scholars (Holland, 1962; Holland and Nichols, 1964; and Holland, 1964). The results were replicated and extended with a more average sample of 12,432 college freshmen in 31 colleges and universities (Abe and Holland, 1965a, 1965b) and again with 1,576 men and 1,571 women from 28 diverse colleges (Holland, 1968). An additional important result of the 1968 study is the finding that percent of correct predictions of personality types was higher for women than men, 72.7% correct three-letter codes for women compared to 64.1% correct three-letter codes for men. This is the reverse of earlier work.

Validation of Holland's constructs has been attained from other researchers. Osipow, Ashby, and Wall (1966) found that college students expressed vocational preferences consistent with
their major personal orientation and that those subjects who were more certain of their vocational preferences showed greater consistency between their first and second choices than did more uncertain subjects. Wall, Osipow, and Ashby (1967) concluded that relationships among personality types, vocational preferences, and SVIB scores lend construct validity to Holland's scheme.

Several factor analyses have yielded support for the convergent and discriminant validity of both the SDS (Holland, 1971a; Edwards and Whitney, 1971; and Holland, 1968) and the VPI (Wakefield and Doughtie, 1973; DiScipio, 1974). Canonical analysis of male subjects' VPI and SVIB scale scores has yielded at least six underlying constructs in one study (Haase, 1971; cf. Navran and Kendall, 1971, who obtained four significant correlations using SVIB factor scores). O'Shea and Harrington (1972b) factor analyzed SVIB and Kuder OIS scores for college males and organized the results in Holland terms. In their opinion, this tied both tests to theory and more effectively insured that an engineer, for example, would receive scores that point toward engineering on both tests (cf. Layton and Borgen, 1972; cf. O'Shea and Harrington, 1972a). Holland (1973a) concludes that there are not fewer than six clearly identifiable types.

**Hexagonal Model**

The entire body of research encompassing the hexagonal model for Holland's instruments and the similarities to spatial
configurations obtained using other instruments validates both Holland's theory and the general construction of interest inventories. Of special relevance here is the work applicable to women (Cole, 1973). In an interesting study, Cole (1972) confirmed that the hexagonal configuration of men's interests over several inventories including the VPI (Holland, et al., 1969; Edwards and Whitney, 1971; Cole and Hanson, 1971) also applies to women. An occupational map was computed and superimposed on the VPI configuration, yielding clear compatibility of the same order as that found by Cole, Whitney and Holland (1971) for men. This spatial ordering of women's interests is also confirmed by Hanson, Lamb and English (1974). A cluster analysis (Nafziger and Helms, 1974) of the SVIB, the Kuder OIS for both men and women, and the Minnesota Vocational Interest Inventory yielded a considerable similarity among the four instruments that also supports Holland's hexagonal model and the usefulness of all three letters of his occupational classification. Other researchers have found partial support for the hexagonal model for men (Elton and Rose, 1970), little model support for men and none for women (Yonge and Regan, 1975), more complicated data relationships than can be explained by a two dimensional hexagon (Lunneborg and Lunneborg, 1975). Although some evidence exists to the contrary, the hexagonal model has generated considerable statistical support.
Aspirations and Job Histories

Additional validity for Holland's typology accrues from the use of his classification to organize and predict occupational aspirations and job histories. In several studies, Holland and his colleagues have looked at the aspirations over time of many male and female students from many colleges. Richards, Holland and Lutz (1966) found that expressed vocational choice viewed in terms of Holland's occupational classification was predictive, more so than six SVIB scales, of later vocational choice. This result was duplicated for the VPI in 1967 by Holland and Lutz and for the SDS in 1975 by Holland and Gottfredson. In general, aspirations have coherence and are efficient predictors of subsequent expressed vocational choices (Whitney, 1969).

In other studies, the Holland group has successfully used the classification to find order in work histories. Both Nafziger (1973) and Holland, et al. (1973) looked at retrospective work histories of national samples of young men. Nafziger's Markov chain analysis produced no results superior to predicting that a subject would maintain on later jobs the Holland code of his initial job. Holland and his colleagues found that lower level jobs were ordered in a significant, efficient way for both Blacks and whites. Nafziger, et al. (1972) got similar results from longitudinal data of men and women sampled nationally.
Finally, two studies relate aspirations to actual employment. Gottfredson, Holland and Gottfredson (1975) used census data on men and women to learn that the distribution of vocational aspirations, but not of SDS codes (from another source), resembles the distribution of employment. Lucy (1971), an outside researcher, studied college alumni from ten to 25 years retrospectively. He found a $p<.001$ relationship between both college major in Holland terms and current VPI code, and current occupation in Holland terms and current VPI code. The positive outcomes of this body of research involving Holland classifications of major, vocational choice and actual jobs supports the typology.

**Special Samples**

Some work has been done on verifying Holland's typological constructs for special groups. Three studies comparing Black and white college students' responses to the SDS (Kimball, Sedlacek, and Brooks, 1973) and to the VPI (Yom, et al., 1975; and Wakefield, et al., 1975) found both instruments to be equally appropriate for both groups, although Doughtie, et al. (1976) found significant differences on some VPI scales. No sex differences were described. Smith (1975) concludes that interest inventories have successfully been used with Black professionals but questions whether generalization can be made to the Black working class, especially since Black youths prefer people-oriented jobs. One study of Chicano students (Turner and Horn, 1975) yielded
little of value.

Conflict over the validity of Holland's theory for women has already been noted. Two reports on sex differences add the most recent information and are relevant to the current research. Alston, et al. (1976) compared male and female college students' VPI responses and found equal construct validity for both groups (cf. Elton and Rose, 1975). Using the SDS scores of high school males and females, Schaefer (1976), investigated the effect on congruence of consistency, homogeneity, ability, and achievement—all crossed with sex. No interaction with sex achieved significance. The research in this paragraph supports Hollands' constructs for Black college students and for women high school and college students.

Taken as a whole, the research involving Holland's basic typology confirms its validity.

SUPPLEMENTARY CONCEPTS

Congruence

Of the supplementary concepts -- congruence, consistency, and homogeneity (differentiation) -- congruence has demonstrated the most power, especially for women. Holland's basic test of congruence (1968) supported the concept for women but not for men. He had earlier determined, using VPI scores and ratings of occupational environment, that both male and female 1958 National Merit
Scholars tended toward congruent choices of field (Holland, 1962). However, Eggenberger and Herman (1972) found support for congruence for male students in Realistic, Artistic, and Enterprising but not Investigative college program environments. Social and Conventional environments were not tested. Also Schaefer (1976) found that sex did not significantly affect congruence.

**Congruence and Personal Stability.** Some evidence exists which relates congruence to its theoretical implications of personal stability, stability of vocational choice and satisfaction. The idea that congruence is associated with personal stability has been corroborated for male students but not for females. Walsh and Russel (1969) found that congruent male students (their VPI type matched the type of their chosen college major) reported significantly fewer personal adjustment problems on the Mooney Problem Checklist than did incongruent students. The results for females yielded $p > .05$. Work by Walsh and Barrow (1971) suggests that the congruence of both male and female freshman students' choice of major is not associated with personality variables measured by the California Personality Inventory. However, Walsh and Lewis (1972), using the Omnibus Personality Inventory, did note as predicted that congruence in males is associated with greater integration while incongruence or indecision about major is associated with greater anxiety. Finally, Williams (1967) reports that rated lack of conflict between freshman male roommates
is positively related to congruence of VPI codes.

**Congruence and Stability of Vocational Choice.** That congruence relates to stability of vocational choice for male students is demonstrated by Brown (1968). This research investigated the effects on college major stability of living on dormitory floors housing many scientific (or nonscientific) students and only a few nonscientific (or scientific) ones. "Minority" students in such environments displayed a significant tendency to change majors in the direction of the majority. Southworth and Morningstar (1970) found significant similarities in VPI for beginning and finishing male engineering students. Holland (1968) tested expressed vocational choices of male and female students over eight- and 12-month periods and compared stability to congruence. Many relationships were observed in the predicted direction, but only a few were significant providing moderate support for this proposal.

**Congruence and Satisfaction with College.** Both Rand (1968) and Morrow (1971) found congruence to be related to satisfaction with college for male and female students. These results agree partially with Holland's 1968 important test which yielded significant results for women but not for men. W. Werner's 1969 results indicate that for 527 boys and girls in six fields of vocational high school selected to represent Holland's six environments, congruent students have higher achievement scores
(teacher ratings) while congruence is positively related to satisfaction for males only. Significantly more congruent students completed training than did incongruent students. Finally, Nafziger, Holland and Gottfredson (1975) validated the congruence-satisfaction with college hypothesis for both male and female students. Congruent females were significantly more satisfied, and greater degrees of congruence was significantly associated with greater amounts of satisfaction for all Ss.

In summary, the existence of congruence has been demonstrated in students of both sexes, but the concept seems more powerful for women. Such power accrues from the relationship of congruence to satisfaction with college rather than to its relationship with personal stability. The moderate correlate stability of vocational choice appears to add little to the balance. Two studies (Schaefer, 1976; and Nafziger, Holland and Gottfredson, 1975) indicate that neither homogeneity nor consistency significantly affects congruence.

**Consistency and Homogeneity**

Respecting these other two supplementary concepts, Holland's main tests of homogeneity (1968) and consistency (1963a, 1968) have yielded significant results for male, but not female samples. Tests by other researchers have reported mostly negative or ambiguous results (Holland, 1973a). Exceptions include two studies (Nafziger, et al., 1972; and Villwock, Schnitzen and Carbonari, 1975).
1976) that found a significant relationship between consistency and vocational stability for both sexes. The Nafziger work involved job stability of workers and found no significant relationship for Blacks of both sexes. The Villwock study measured stability of students' choice of major and found that while consistency correlated significantly with stability, congruence accounted for most of the variance in stability. Finally, Gottfredson, Holland, and Gottfredson (1975) suggest that the concept of consistency appears strengthened by the rare occurrence of inconsistent subtypes among both people (SDS data) and jobs (Bureau of Census employment data). Very inconsistent subtypes include both combinations of R/S (Realistic/Social and Social/Realistic), I/E, and A/C. While it is true that the Census data reported no people working in AC, CA or EI jobs, the numbers working in IE, SR, and especially RS jobs cannot be considered inconsequential. These data would seem to strengthen the idea of consistency for some subtypes and seriously weaken it for others.

EMPLOYED SAMPLES

Employed Males

Due to the special characteristics of the sample in this study, perhaps the most directly relevant research concerns employed samples. Several researchers have studied employed males
with respect to Holland's theory.

The most comprehensive test was made by Hughes (1972), who administered the VPI, SVIB, 16PF, a job satisfaction scale and several other tests to 400 non-volunteer males, ages 25-35 years. No information on socio-economic status was provided, and 239 occupations were represented. When the subjects were classified by personality and occupation type, a number of investigations were made. The results were generally negative with the men tending not to possess the personality type expected on the basis of their occupational type (a 14-42% range of agreement, depending on the instrument), and with those who did "match" tending not to report greater job satisfaction or stability. Hughes concluded that Holland's theory of personality orientations tied to occupational choices expressed in inventoried interests and personality traits has yet to be demonstrated as a uniformly viable construct in the adult working world.

A series of other research contradicts Hughes' findings. Lacey (1970, 1971) investigated the concurrent validity of Holland's theory by administering the VPI and three need measures each having five satisfaction scales to samples of workers in occupational environments comparable to Holland's six vocational environments. The study considered whether the VPI distributes the group interest patterns in accordance with the theory. Volunteer male workers (N=230) in different occupations were studied --
project engineers (Realistic environmental type); research chemists and computer programmers (Investigative); actuaries (Conventional); high school teachers (Social); bank executives and insurance company executives (Enterprising); and college English professors and music teachers (Artistic). All workers had been employed in their current occupations for at least ten years and had completed a baccalaureate degree. Of the 395 questionnaires distributed in Ohio, New York, and New Jersey, 250 were returned and 230 were adequately completed. A number of predictions were made concerning differentiation of groups on the basis of interest patterns, homogeneity, and job satisfaction in terms of need satisfaction. The Investigative, Social Conventional, Enterprising, and Artistic VPI vocational scales successfully differentiated each of the occupational groups. With the exception of the Enterprising scale, each occupational group peaked on the vocational scale congruent with Holland's vocational model. As predicted by Holland, Realistic, Enterprising, and Investigative groups achieved higher Masculinity VPI scores than other groups. On the Status scale, business executives (Enterprising) had the highest mean scale score, with chemists and computer programmers (Investigative) yielding the lowest mean scale score of the occupational groups. These results are all consistent with Holland's theory. Thus, with the exception of the Realistic VPI scale, these data support the concurrent validity of Holland's predictions.
Although Hughes' sample was larger, more diverse, and produced more different kinds of data, Lacey's more positive results may be attributable to his subject selection with control of possible troublesome variables.

In a study similar to Lacey's, Gaffey (1972) expanded the idea of testing the concurrent validity of Holland's theory using subjects employed in representative occupations. In addition to the VPI, he also administered the Self-Directed Search (SDS) and Sets I and II of the Holland Scales (Campbell and Holland, 1972) -- alternative operational statements of Holland's typological constructs. Gaffey investigated the inventory responses of 153 college-degreed males at least 26 years of age with at least one year of experience in their current occupation. Samples were drawn from the following groups chosen to represent the environment in parentheses: industrial engineers (Realistic); medical doctors (Investigative); ministers (Social); morticians (Conventional); insurance company salesmen and real estate salesmen (Enterprising); and artists and art teachers (Artistic). Of 241 questionnaires distributed in Ohio, Pennsylvania, Massachusetts, and Maryland, 157 were returned and 153 were acceptable as completed. Results of analyses of variance were reported by instrument. On Set I of the Holland Scales, the rest for the main effect of groups was found to be significant for all six variables. Each vocational scale with the exception of
Investigative distributed the six occupational groups according to their interests in a theoretically appropriate manner. Similar data resulted from analysis of the Set II Holland Scales. Again each vocational group except medical doctor (Investigative) peaked on the appropriate scale and was significantly different from other groups in expected ways. Engineers also peaked on the Investigative Scale (their mean score was higher on their own scale, Realistic), but medical doctors had the second highest mean Investigative score and were adequately differentiated from two other occupational groups. The test for the main effect of groups was significant for all six scales. On the SDS, significance for the main effect of groups over all six scales was again obtained. The Realistic, Artistic, Social, and Enterprising Scales successfully discriminated among the six groups. Finally, the Investigative, Social, Conventional, Enterprising and Artistic vocational scales of the VPI and the Self-Control, Masculinity, Infrequency, and Acquiescence nonvocational VPI scales showed significant results in the test for main effects of groups. Generally, the Investigative Scale was the most problematic construct across instruments. In summarizing his results, Gaffey stated that the main outcomes evidence some support for the concurrent validity of Holland's theory. Yet the instruments did not discriminate as clearly as the theory would predict. The Holland Scales, Sets I and II, and the VPI were found to
discriminate effectively among the occupational groups on five scales while the SDS discriminated effectively among the groups of four scales.

The use of the SDS and VPI are especially relevant to the present study. It is interesting to note that the SDS yielded significant main effects for all six scales, while only five vocational scales of the VPI were significant. When these data were analyzed to determine whether occupational groups peaked on the expected scales, however, the VPI conformed to theory in five of six cases, while the SDS did so in only four of six cases. Gaffey and Walsh (1974) report a correlation of the Gaffey (1972) data for the same-named scales for all possible combinations of the four inventories. These were all found to be significant at the .01 level, lending further support to Holland's theory and suggesting that same-named scales are tapping into similar constructs.

Responding to the statements of Lacey (1970, 1971) and Gaffey (1972) that their studies were limited by the use of college-educated samples, Fishburne (1973) administered the VPI and the SDS to selected occupational groups of non-college-degreed males. From Ohio and South Carolina, he obtained 126 volunteers who were from 20 to 70 years of age, were employed in their present occupation for at least one year, and had completed no more than two years of college. Subjects were
distributed among six occupational groups chosen to correspond with Holland's types as follows: barbers (Realistic); electronic technicians (Investigative); photographers (Artistic); bartenders (Social); gas station managers (Enterprising); and accounting clerks (Conventional). Fishburne found that five scales of the VPI (vocational -- Artistic and Conventional; nonvocational -- Status, Infrequency, and Acquiescence) were significant in the test for main effects of groups. This means that only photographers and accounting clerks were differentiated significantly from other occupational groups on the vocational scale corresponding to their environmental types. Analysis of the results indicate that data from the Artistic, Conventional, Status, and Infrequency Scales of the VPI support Holland's formulations. The test for the main effects of groups was found to be significant for all six scales of the SDS. All scales except the Realistic Scale differentiated the occupational groups in accordance with Holland's model. These SDS data support the concurrent validity of both the instrument and the theory. The addition of activity, competency, and self-rating components seems to increase the discriminatory power of the SDS over the VPI. An analysis of the correlation between same-named occupational scales of the two instruments yielded significant, high coefficients -- an expected result since some VPI items are contained in the SDS scales. Correlation coefficients for the same-named scales of the VPI and
SDS summary scales were found to be moderate but all still significant. Taken together, the correlational results were lower for non-college males than for the college males used by Gaffey and Walsh (1974). In comparing their results for the VPI and SDS with the results of Gaffey and Walsh (1974), Fishburne and Walsh (1974) suggest that the VPI seems more effective at the college-educated and professional level than with non-college-degreed male workers. The SDS yielded consistent results in both studies which suggests that it effectively discriminates among occupational groups of both college- and non-college-degreed male workers.

O'Brien (1975; O'Brien and Walsh, 1976) concurs with Fishburne's 1973 results by supporting the concurrent validity of Holland's theory for non-college-degreed Black men. Investigation was made of the vocational scale VPI and SDS summary scores of subjects who were distributed among the following six occupations representing Holland's environments: maintenance men (Realistic); x-ray and laboratory technicians (Investigative); musicians and entertainers (Artistic); youth leaders (Social); salespersons (Enterprising); and inventory clerks (Conventional). The multivariate test for the main effect of groups was highly significant ($p<.001$) and the univariate test for the main effect of groups was significant for all scales of the VPI except Investigative and for all scales of the SDS except Social. Significant differences among mean scores of occupational groups were found for the VPI
Artistic, Social, Enterprising, and Conventional Scales, and for the SDS Realistic, Investigative, Artistic, and Conventional Scales. Further, the appropriate occupational group scored the highest mean on each of these scales, except the VPI Social, as well as on the VPI Realistic and the SDS Enterprising Scales. Correlations between the same-named scales of the two instruments were significant, but moderate. The SDS scales more frequently identified specific occupational group differences than the VPI, but both instruments were found to be valid for use with non-college-degreed Black working men.

The last four studies utilized a different research approach than did Hughes (1972) and generally attained more positive results. The addition of the SDS data is especially important since it might in some ways be more effective than the VPI with non-college-degreed female workers also. The results of the Holland Scales seem less relevant to this study since many SVIB occupations require a college education.

Several studies have compared the expected and observed Holland codes of specific occupational groups of men. Schuldt and Stahmann (1971) found a group of clergymen to score SAIE (highest score on the Social scale; second highest score on the Artistic scale, etc.) on the VPI, a result that supports Holland's theory. Similarly, Fabry (1976) verified the Holland three point codes for clergymen (SAI) and gas station attendants (REC;
Holland changed this code from ESI. He obtained a code of ESA for life insurance agents (predicted ESI), and a code of IER for policemen (predicted RCE).

Snyder (1970) studied accountants using the VPI, the Interpersonal Check List, and a measure of job satisfaction. A definite personality type was demonstrated for accountants with some non-significant indications of differences between public and private organizations. As a result of the latter non-significance, a congruence-satisfaction test was inconclusive. Job satisfaction was significantly related to perceived self-other interpersonal congruence.

In an interesting test of the consistency-satisfaction hypothesis, Gilbride (1973) has added to the research on the clergy. Comparing VPI, Adjective Check List and biographical data on 50 active and 50 resigned priests, he found that both groups obtained their highest scores on Holland's Social, then Artistic Scales and generally exhibited marked similarities in scoring patterns on the VPI. The ACL did reflect some significant differences with the resigned priests scoring higher on self-confidence, achievement, dominance, endurance, and order. The lack of relationship between consistency and job satisfaction is tempered both by the fact that 80% of the resigned priests were employed in another Social occupation and by the results of an earlier study. Osipow (1970) administered the VPI and a work role check
list to employed clergymen. Included in the list were roles that clergy might perform, such as administrator, preacher, scholar, musician, etc. VPI results were in accord with Holland's theory and the findings of other researchers, but many Ss reported that their jobs included many tasks having little relationship to their personality type. From this conflict it could be concluded that the personality and occupation of clergymen are not related or that many clergymen find frustration in their jobs, perhaps due to an inaccurate but pervasive occupational stereotype. No direct job satisfaction measure was used here. Thus, Gilbride's (1973) resigned clergy may actually be individuals who sought an occupational environment more consonant with their personal orientation.

Two other studies in Holland terms of employed men (Bates, Parker and McCoy, 1970) and employed men and women (Wigington and Apostal, 1973) add little to the present discussion. Generally, research on employed male samples, both college- and non-college-degreed, supports Holland's formulations.

Employed Females

Three studies of female samples deserve mention. Harvey and Whinfield (1973) conducted a correlational study using 61 adult women entering group guidance and testing. On the basis of a priori predictions derived from Holland's definitions of the personality types, Harvey administered the VPI and several
personality instruments and assessed the validity of Holland's approach for conceptualizing the interests of adult women. His results supported the VPI with some doubt cast on the Artistic and Social Scales and general reliability of the VPI.

J. Werner's complex research (1969) involved the strategy of securing subjects from six types of occupations — production workers (Realistic); research scientists and technicians (Investigative); commercial artists, interior decorators and writers (Artistic); teachers (Social); professional managerial or supervisory persons (Enterprising); and bank employees (Conventional). Women from 17 to 60 years old (N=348) completed the VPI and the Employed Women's Questionnaire. This represented a 58.2% return on a single questionnaire mailing. The women were employed full-time, and Werner reports that some had attended college although many had no education beyond high school. The VPI profiles were generally as expected by Holland. Werner found, however, that hypotheses concerning homogeneity, congruence, and consistency with respect to achievement (salary), expressed satisfaction, and length of time on the job yielded many negative and equivocal results. Of most interest here is the congruence and satisfaction analysis. A chi-square test of the relationship between congruence and satisfaction for the total group and for each of the six occupational groups revealed no significant differences. Congruence or incongruence was determined by whether a subject's
highest VPI code matched the code of her occupation. Significant differences obtained for the total sample disappeared when analysis by occupation type was computed. Neither this study nor the Harvey and Whinfield (1973) study utilized the SDS or explicitly considered the educational level of subjects.

These considerations were made by Horton (1975; Horton and Walsh, 1976), who studied the VPI, SDS, and Holland Scales scores of 179 college-degreed women employed as engineers (representing Holland's Realistic environment); physicians (Investigative); architects (Artistic); ministers (Social); lawyers (Enterprising); or accountants (Conventional). Results support the concurrent validity of Holland's theory via all four instruments. The six occupational groups were significantly different on all scales of the VPI except Conventional, all scales of the SDS, and all of the Holland Scales Sets I and II except Enterprising. Occupational groups were differentiated in accord with Holland's theory by five scales of the VPI, all scales of the SDS, and four scales of the Holland Scales Sets I and II. Finally the expected occupational groups peaked on the expected scales except for the Investigative scales of all four instruments, the SDS Realistic Scale, and the VPI and Holland Scales Sets I and II Enterprising scales. In all, the SDS was slightly more effective with college-degreed working women.
The question of the use of the SDS with non-college-degreed working women remains. Lewis and Sedlacek (1972) found differences in SDS codes in male and female college freshmen significantly related to differences in father's education level, a correlate of SES. While some results have supported the use of the VPI with such women and negative results have been observed for the congruence-satisfaction hypothesis, further clarification is desirable. This is especially true since research on women students has yielded strongly positive relationships between congruence and other satisfaction variables. In summary, some evidence has accrued for the use of Holland's theory with adult, employed samples; thus, a foundation exists for further investigation of the growing number of women who fall into this category.

OVERVIEW OF THIS STUDY

The intent of the present study is to test via the VPI and the SDS the concurrent validity of Holland's theory of vocational choice on a sample of employed, non-college-degreed women representing Holland's six occupational types. The congruence-satisfaction hypothesis and the relationships among same-named inventory scales are also tested. Several variables involved in this research are of particular note.
Socioeconomic Status

First, controlling education level also indicates some control of SES level, at least for men. Nafziger, et al. (1972) report that the GED (education) level of jobs correlated .8 with Duncan's occupational prestige SES rating. Hollingshead's famous two factor index of social position (1957) is computed from knowledge of education level and occupation. As noted earlier, SES is an important variable in occupational discussions, but women's status is generally derived from that of a male relative. Haug (1973) addresses this problem and finds that families where both spouses work may be misclassified if information on the male only is used to determine SES. She advocates application of SES measures to attributes of both spouses and assignment of the higher result to the family.

Non-professional Occupations

Controlling both women's education and perhaps SES has implications for the kinds of occupations that will be included in the study. Kievett (1972) articulates the incongruity of the amount of research done on college educated women compared with the lack of information available on the work patterns of women in the skilled, semi-skilled, and service occupations where the majority of women are employed. Applicable here is Diamond's creative approach to sex and interests (1968, 1970, 1972).
Diamond has investigated occupation level as an alternative to masculinity/femininity measures and found (1968) that sex differences were minimized at the high end of the occupational continuum (professional) but were very much in evidence at the low end (non-professional). Another look at the data indicated some confusing results for low occupation level women, possibly due to their working at low level jobs for other reasons than interest. The sharply differentiated masculine and feminine interests at the non-professional levels combines with the fact already discussed of women's employment in typically feminine jobs to present the typical female employee as a rather traditional individual.

**Sex-Role Ideology**

Such a picture introduces yet another variable, sex-role ideology (which could be considered a subset of Super's self-concept). The potential importance of ideology in vocational theory for women has already been mentioned (Gaskell, 1975; Sibbison and Peters, 1975). A number of studies have delineated many differences between traditional and non-traditional women. To some researchers that distinction is the one between homemakers and working women (for example, Schissel, 1968; Surette, 1967; Astin, 1968; Kriger, 1972; and Munley, 1974). To other researchers, it is the distinction between women working at traditional and non-traditional jobs (for example, Cowan and Moore, 1971; Almquist and Angrist, 1970; and Veres and Moore, 1975). Differences
have been supported for both distinctions. It seems, then, that variations in sex-role ideology may intervene in women's occupational functioning.

**Satisfaction**

Finally, there is the question of why women work. Evidence that relationships between Holland variables and satisfaction are higher for women students than men has already been mentioned. Of interest here is a study noting differences in work values for men and women. Wolfe (1969) mailed questionnaires to 4,003 relatively unselected women in New York State, receiving 1,871 returns. She related demographic variables — age, education, marital status, SEC, field of work, and career pattern — to work values — achievement-mastery, social, dominance-recognition, independence, salary, and steady work. From other research, men were found to value most steady work, independence and prestige on the job. For women, the most important work value across all demographic variables was achievement-mastery and the second most important was social. Both are stronger than salary for any demographic category. Women with the least education had the lowest expectation that their work would be interesting. This study is limited by the low rate of questionnaire return, a lack of either randomness or selection of subjects along specific lines, and a lack of indication of the economic responsibilities of participating women. It would also be interesting to know more about the
characteristics of the comparison males. Wolfe's results do agree with Campbell and Harmon's (1968) conclusion that non-professional women pay considerable attention to the nature of work when choosing a job as opposed to taking one that best fits their hours or pays the most. It appears, then, that a psychological conception of job satisfaction (one works and continues to work at a job because it satisfies some important inner needs) testable via Holland's congruence-satisfaction hypothesis rather than an economic conception of job satisfaction (one works at the highest-paying job available) is viable for women. However, personal economic responsibilities and general economic conditions must also be considered.

In summary, this study investigates the concurrent validity of the VPI and the SDS for volunteer women with less than two years of college education who have worked full-time for at least one year in one of six traditional, non-professional occupations representing Holland's six environments. SES information is supplied, but no attempt was made to measure sex-role ideology. Tests of Holland's congruence-satisfaction hypothesis and the same-named VPI and SDS scales are included.
CHAPTER III

METHODOLOGY

SAMPLE

In order to study the congruence of personality and occupational types for employed, non-college-degreed women, around 20 women from each of six representative occupations were secured. The occupations represent the environmental types as follows: assemblers (Realistic); laboratory technicians (Investigative); floral designers (Artistic); ward attendants (Social); salespersons (Enterprising); secretaries (Conventional). Where possible, an effort was made to obtain homogeneity within occupations by using Civil Service classifications or specific titles -- electronics assembler (Realistic), psychiatric aide (Social), and clerk-typist (Conventional). The six occupations were chosen from Holland's *The Occupations Finder* (1974a), which lists jobs according to their Holland code and includes an education level for each job -- Levels 1 and 2 indicate that elementary school or no special training is required; Levels 3 and 4 indicate that high
school and some college or technical training is needed; and Levels 5 and 6 indicate that college training is required. Care was taken to include only occupations rated Level 4 or below. Occupations were also chosen which employ many women. In fact, Bem and Bem (1973) report that 78% of all employed women work in clerical, service, factory, and sales jobs. So the occupations included in this sample were chosen to represent Holland environments, do not require a college degree, and are typical of women's employment.

Data was provided by 114 volunteers distributed among the six occupations as follows: assemblers, N=19; laboratory technicians, N=15; floral designers, N=19; ward attendants, N=20; salespersons, N=20; clerk-typists, N=21. Of 154 data packets that were distributed, 147 were returned. Thirty were incomplete, two were disqualified, and one was returned too late to be included in the study. The two disqualifications marked the entire list of 160 occupations in the VPI "dislike." Such responses may or may not be individually valid for those subjects; thus, it is difficult to justify their inclusion in a study of test validity. Of the subjects included in the study, 78 were from Ohio and 36 were from Texas. Texans comprised a portion of four of the six occupational samples. Three requirements were met by all subjects -- age must be at least 18, education must not exceed two years of college, and time employed in the present occupation must be at
least one year.

PROCEDURE

Volunteers for the study were obtained in their place of employment with the permission of their employer. Each subject was given a data packet containing an introduction to the study, instructions, a biographical data sheet (see Appendix A) and two of Holland's inventories, the Vocational Preference Inventory and the Self-Directed Search. These materials were picked up from the subjects at a later date, sometimes after two or three contacts, and feedback was provided to those who desired it. Subjects were assured of confidentiality.

INSTRUMENTS

Vocational Preference Inventory (VPI)

The VPI, Sixth Revision (Holland, 1965) was used as one assessment of personality types. This instrument consists of 160 occupational titles. The like/dislike/undecided ratings to these titles given by a subject yield scores on eleven scales -- six vocational scales (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional), three additional scales (Masculinity, Self-Control and Status), and two response set scales (Acquiescence and Infrequency). The personality scales are composed of 14 items each; the Acquiescence Scale has 30 items; and
Infrequency, 20. With the exception of Acquiescence, no scale contains overlapping items. Kuder-Richardson 21 coefficients of internal consistency indicate that reliability on vocational scales ranges from .76 to .89 for 6,143 female college freshman, .83 to .89 for 6,289 male college freshmen, and .89 to .93 for 232 employed adult males (Holland, 1965). Test-retest reliability coefficients vary widely with the interval between testing, the coefficients decreasing as the amount of time increases. In general, reliability is moderate to high and efficiency of predictive validity is moderate to poor (Holland, 1965).

Self-Directed Search (SDS)

Holland considers the SDS (Holland, 1971a, 1971b, 1972) a self-administered vocational counseling tool. This is a broader designation than is usually accorded an "interest inventory," and, indeed, this instrument presents a wider than usual variety of tasks including determination of one's own scores and location of possible occupations in The Occupations Finder (Holland, 1974a). Additionally, the SDS includes Occupational Daydreams (a measure of aspiration history), six Activities scales of 11 items each, six Competencies scales of 11 items each, six Occupations scales of 14 items each, and two sets of Self-Estimates involving personality types, and represents an expansion of the VPI (VPI items appear in the six Occupations scales) to include further research.
Kuder-Richardson 20 internal consistency coefficients for Activities, Competencies, and Occupational Scales (describing the six types) range from .53 to .85 for 366 women and from .63 to .88 for 358 men. Test-retest coefficients are higher for college freshmen than for high school students even over a longer interval. Studies by O'Connell and Sedlacek (1971) and Zener and Schneulle (1972) indicate that SDS summary codes are reasonably stable for both males and females.

**Biographical Data Sheet**

Demographic data was collected from the subjects via a sheet of questions compiled by the researcher (see Appendix A). This information provided a check on subject limitations of age, education, job title, and amount of time in current occupation. Included were also items relevant to why women work, such as marital status, and number of children. Item #8 is a direct, five-point measure of general job satisfaction of a sort that has received some support in the literature (Weiss, et al., 1967; Wanous and Lawler, 1972).

Additionally, education and occupation information about women and their husbands from the biographical questionnaire was used to compute two factor indices of social position for each family (Hollingshead, 1957). Occupations are compared to a seven-level occupational prestige scale and given a prestige score.
Education is compared to a seven-position scale and assigned a position. For each individual, occupation and education factors are combined by multiplying their scale positions by weights derived empirically (7 for occupation and 4 for education) and adding the two resulting numbers. This two factor index provides an SES continuum which Hollingshead has broken into five social classes.

The validity of this measure is supported by two studies of the stability of occupational prestige measures over time (Hodge, Siegel and Rossi, 1964; and Fossum and Moore, 1975). Haug's (1973) suggested use of the measure for both working spouses and assignment of the family's SES value based on the higher ranking spouse were adopted in this study. Only four families received higher SES levels on the basis of the wife's occupation and education.

Resulting information about these and other variables obtained from the Biographical Data Sheet is summarized by occupation of the women in Table 1. The mean rating of job satisfaction for the group (2.98 on a 1-5 scale) indicates that this is a generally satisfied sample and thus can be considered as acceptable representatives of their occupations. The SES levels, with a possible range from Level I (highest) to Level V (lowest), of the heads of subjects' households fell mainly in the middle to lower range. Heads of 58% of the families belong to Level IV with 81% belonging to Levels III and IV.
<table>
<thead>
<tr>
<th>Variables from Biographical Data Sheet by Occupational Group</th>
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<tbody>
<tr>
<td>Assemblers</td>
</tr>
<tr>
<td>Years in pres.</td>
</tr>
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<td>Job Mean</td>
</tr>
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</tr>
<tr>
<td>1 - 6</td>
</tr>
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<td>7 - 9</td>
</tr>
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<td>10 - 12</td>
</tr>
<tr>
<td>some coll.</td>
</tr>
<tr>
<td>1 - 2 yrs. coll.</td>
</tr>
<tr>
<td>Number of other jobs held</td>
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</tr>
<tr>
<td>1</td>
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<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>more than 3</td>
</tr>
<tr>
<td>no response</td>
</tr>
<tr>
<td>In this occ. by-</td>
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<tr>
<td>plan</td>
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<tr>
<td>chance</td>
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<td>aft. consid. oth.</td>
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<td>other</td>
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<tr>
<td>no response</td>
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TABLE 1 (cont.)

Variables from Biographical Data Sheet by Occupational Group

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<th></th>
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<th>Laboratory Technicians</th>
<th>Floral Designers</th>
<th>Ward Attendants</th>
<th>Salespersons</th>
<th>Clerk-typists</th>
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<td><strong>Satisfaction</strong></td>
<td></td>
<td></td>
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<td></td>
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<td>3.21</td>
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<td>20 - 60</td>
<td>20 - 60</td>
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<td><strong>Cur. Mar. Status</strong></td>
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<td>8</td>
<td>9</td>
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<td>1</td>
<td>0</td>
<td>1</td>
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<td>1</td>
<td>2</td>
<td>0</td>
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<td>1.2</td>
<td>2.0</td>
<td>1.4</td>
<td>1.0</td>
</tr>
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<td>0 - 5</td>
<td>0 - 5</td>
<td>0 - 4</td>
<td>0 - 2</td>
</tr>
<tr>
<td><strong>S E S</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(hi) I</td>
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<td>0</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
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<td>2</td>
<td>0</td>
<td>0</td>
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<td>III</td>
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<td>1</td>
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<td>7</td>
<td>14</td>
<td>6</td>
<td>15</td>
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<td>0</td>
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HYPOTHESES AND STATISTICAL TESTS

Mean scores and standard deviations were computed for each occupational group on the occupational scales of the VPI, the SDS, and the satisfaction item. Four hypotheses were tested. The .05 level was chosen to indicate significant results.

Hypothesis 1

Significant differences among the mean scores of the six occupational groups (assemblers, laboratory technicians, floral designers, ward attendants, salespersons, and clerk-typists) are expected on each of the six occupational scales of the Vocational Preference Inventory and the Self-Directed Search (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional).

This expectation was first tested by multiple analysis of variance. Briefly described, this procedure develops a linear functional which when applied to a set of dependent variables (test scores) produces a variable that optimally discriminates differences among independent variables (occupational groups). The test of statistical significance applied to the result determines whether the means of the dependent variables, considered simultaneously, are equal (Kerlinger and Pedhazur, 1973). Yet such a procedure does not assume the independence of the variables involved and, in fact, acts to reduce the influence of variance in common to several of the variables. Use of MANOVA requires that the set of variables tested share a common conceptual meaning (Finn, 1974). Application of MANOVA to the current data both adheres to sound statistical practice and provides a basis for
confidence in the significance of any differences among group means revealed by subsequent analyses (Cramer and Bock, 1966).

Following a significant MANOVA result, a separate univariate analysis of variance was performed on each of the 12 VPI and SDS scales (Hummel and Sligo, 1971). Each significant F-ratio was subsequently investigated using a Tukey (b) multiple comparisons procedure (Winer, 1971, p. 198) to explore the nature of differences between specific treatment means. In this inquiry, pairwise comparisons of group means along an ordered scale identify pairs of means that are significantly different at the .05 and .01 levels determined by Tukey (b) critical values.

Of the several statistics that can be used for post hoc multiple comparisons, a choice is often made between the Scheffé and Tukey methods. Ferguson (1966) recommends Scheffé, Glass and Stanley (1970) prefer Tukey when possible, and Winer (1971) chooses Tukey (a). All use the same reason, that Tukey yields a greater number of significant results than Scheffé, the most conservative method with respect to Type I error. Tukey (b) is still less conservative than Tukey(a). It was chosen in this study for its power, since theoretical controls on the interpretation of results are available, and for purposes of comparability to other similar research.

Post hoc comparisons were made in this study despite a theoretical framework that could seem to support some a priori
comparisons. This choice stems from the use of $S$s from only one occupation to represent each occupational category, the relatively unknown response patterns of the kind of $S$s chosen, the small group $N$s, and the difficulties of data interpretation based on Holland's hexagonal model.

A secondary view of distinctions among occupational groups was presented by a comparison of occupational group means ranked from highest to lowest for each scale of each instrument. Such a display could reveal rough scoring patterns.

**Hypothesis 2**

Significant differences among the mean scores of the six occupational groups (assemblers, laboratory technicians, floral designers, ward attendants, salespersons, and clerk-typists) are not expected on the satisfaction item of the Biographical Data Sheet (see Item #8, Appendix A).

This expectation was submitted to a univariate analysis of variance followed by Tukey (b) comparisons.

**Hypothesis 3**

Significant differences are expected between the mean scores of congruent and incongruent subjects on the satisfaction item of the Biographical Data Sheet (see Item #8, Appendix A).

A subject was designated as congruent when her predominant personal orientation as measured by the SDS or the VPI matched the Holland environment her occupation represented in this study. For example, an assembler whose highest score on the SDS was on the Realistic Scale would be considered congruent since assembly work
falls in the Realistic Holland environment. If her highest SES score were on the Conventional Scale, she would be considered incongruent as defined by the SDS.

This expectation was tested separately for the results of the VPI and the SDS by one-tailed t-tests.

**Hypothesis 4**

The six scales of the Vocational Preference Inventory and the six scales of the Self-Directed Search bearing the same name (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional) are expected to be positively and significantly correlated.

This expectation was tested via a Pearson product-moment correlation coefficient matrix.
CHAPTER IV

RESULTS

The results of the statistical analyses generally supported the hypotheses. An account of the means and standard deviations of occupational group scores by VPI and SDS scales appears in Tables 2 and 3. Particular outcomes will be presented in four sections by hypothesis.

HYPOTHESIS 1

Significant differences among the mean scores of the six occupational groups (assemblers, laboratory technicians, floral designers, ward attendants, salespersons, and clerk-typists) are expected on each of the six occupational scales of the Vocational Preference Inventory and the Self-Directed Search (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional).

The three primary analyses in this section -- MANOVA, ANOVA, and Tukey (b) procedures -- relate to the significance of differences among mean scores of the six occupational groups on the occupational scales of the VPI and the SDS. The results of the multivariate analysis of variance across the 12 scales for the two inventories tends to support the first hypothesis: the multivariate
TABLE 2
Means and Standard Deviations of Occupational Group Scores on VPI Scales

<table>
<thead>
<tr>
<th></th>
<th>Realistic</th>
<th>Investigative</th>
<th>Artistic</th>
<th>Social</th>
<th>Enterprising</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assemblers</td>
<td>3.63*</td>
<td>3.21</td>
<td>3.89</td>
<td>6.84</td>
<td>3.79</td>
<td>4.63</td>
</tr>
<tr>
<td></td>
<td>3.53**</td>
<td>3.42</td>
<td>3.78</td>
<td>3.29</td>
<td>3.36</td>
<td>3.90</td>
</tr>
<tr>
<td>Laboratory</td>
<td>1.80</td>
<td>4.27</td>
<td>4.00</td>
<td>4.20</td>
<td>2.47</td>
<td>1.93</td>
</tr>
<tr>
<td>Technicians</td>
<td>1.97</td>
<td>3.52</td>
<td>4.57</td>
<td>3.63</td>
<td>2.77</td>
<td>1.75</td>
</tr>
<tr>
<td>Floral Designers</td>
<td>2.37</td>
<td>3.32</td>
<td>6.63</td>
<td>3.84</td>
<td>3.79</td>
<td>2.74</td>
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<tr>
<td>Ward Attendants</td>
<td>3.10</td>
<td>4.60</td>
<td>5.80</td>
<td>7.80</td>
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<td>3.45</td>
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<td></td>
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<td>3.62</td>
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<td>3.70</td>
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<td>3.54</td>
<td>4.09</td>
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<tr>
<td>Clerk-typists</td>
<td>0.86</td>
<td>1.67</td>
<td>3.05</td>
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<td></td>
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<td>3.79</td>
<td>3.65</td>
<td>3.06</td>
<td>3.05</td>
</tr>
</tbody>
</table>

* mean is first entry

** standard deviation is second entry
TABLE 3

Means and Standard Deviations of Occupational Group Scores on SDS Scales

<table>
<thead>
<tr>
<th></th>
<th>Realistic</th>
<th>Investigative</th>
<th>Artistic</th>
<th>Social</th>
<th>Enterprising</th>
<th>Conventional</th>
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<td></td>
<td>2.68**</td>
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<td>3.59</td>
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<td>Laboratory</td>
<td>4.87</td>
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<td>11.20</td>
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<tr>
<td>Technicians</td>
<td>3.58</td>
<td>3.58</td>
<td>4.59</td>
<td>3.28</td>
<td>2.07</td>
<td>4.13</td>
</tr>
<tr>
<td>Floral Designers</td>
<td>2.37</td>
<td>2.42</td>
<td>8.37</td>
<td>10.53</td>
<td>9.05</td>
<td>5.42</td>
</tr>
<tr>
<td>Ward Attendants</td>
<td>3.95</td>
<td>5.05</td>
<td>7.15</td>
<td>12.55</td>
<td>5.25</td>
<td>5.30</td>
</tr>
<tr>
<td>Salespersons</td>
<td>2.72</td>
<td>3.76</td>
<td>3.63</td>
<td>2.33</td>
<td>2.92</td>
<td>2.54</td>
</tr>
<tr>
<td>Clerk-typists</td>
<td>2.60</td>
<td>3.55</td>
<td>3.55</td>
<td>9.90</td>
<td>7.55</td>
<td>7.70</td>
</tr>
<tr>
<td></td>
<td>2.52</td>
<td>2.64</td>
<td>2.50</td>
<td>2.94</td>
<td>3.14</td>
<td>2.94</td>
</tr>
</tbody>
</table>

* mean is first entry

** standard deviation is second entry
test for the main effect of occupational groups ($F=3.505$, $p<.001$) indicating group differences across the scales.

Results of subsequent univariate analyses of variance performed on occupational group means by scale are presented for VPI scales in Table 4 and for SDS scales in Table 5. For two of the VPI scales, Realistic and Artistic, the analyses were significant at $p<.05$. The VPI Social Scale analysis was significant at $p<.01$. Thus, $F$ tests for three of the six VPI scales achieved significance in this study. All scale analyses of the SDS were significant at $p<.001$ except for the Social Scale, which was significant at $p<.01$.

Tukey (b) multiple comparisons computed for VPI scales are summarized in Table 6. Only those three VPI scales which had significant $F$ tests in the analyses of variance were submitted to multiple comparisons, and only those pairs of means found to be significant out of all the possible pairs of means analyzed were included in the table.

Results on the Realistic Scale indicated that the mean score of assemblers was significantly different from the mean score of clerk-typists at $p<.05$. No differences between pairs of means appeared at the $p<.01$ significance level. Floral designers differed significantly from salespersons at $p<.05$ on the Artistic Scale. Again no significant differences were observed at $p<.01$. Finally, the VPI Social Scale yielded significant differences at $p<.05$ for
## TABLE 4

Univariate Analysis of Variance for VPI Occupational Scales

<table>
<thead>
<tr>
<th>Source (scale)</th>
<th>df</th>
<th>ms</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>5, 108</td>
<td>19.952</td>
<td>2.891</td>
<td>0.017&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Investigative</td>
<td>5, 108</td>
<td>21.157</td>
<td>1.452</td>
<td>0.212</td>
</tr>
<tr>
<td>Artistic</td>
<td>5, 108</td>
<td>48.694</td>
<td>2.986</td>
<td>0.015&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Social</td>
<td>5, 108</td>
<td>57.275</td>
<td>4.304</td>
<td>0.001&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Enterprising</td>
<td>5, 108</td>
<td>5.946</td>
<td>0.651</td>
<td>0.661</td>
</tr>
<tr>
<td>Conventional</td>
<td>5, 108</td>
<td>15.626</td>
<td>1.274</td>
<td>0.280</td>
</tr>
</tbody>
</table>

<sup>a</sup> p < 0.05

<sup>b</sup> p < 0.01
### TABLE 5

Univariate Analysis of Variance for SDS Scales

<table>
<thead>
<tr>
<th>Source (scale)</th>
<th>df</th>
<th>ms</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>5, 108</td>
<td>39.990</td>
<td>6.032</td>
<td>0.001&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Investigative</td>
<td>5, 108</td>
<td>91.724</td>
<td>10.857</td>
<td>0.001&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Artistic</td>
<td>5, 108</td>
<td>55.254</td>
<td>4.796</td>
<td>0.001&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Social</td>
<td>5, 108</td>
<td>22.885</td>
<td>3.362</td>
<td>0.007&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Enterprising</td>
<td>5, 108</td>
<td>66.133</td>
<td>8.744</td>
<td>0.001&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Conventional</td>
<td>5, 108</td>
<td>120.552</td>
<td>11.368</td>
<td>0.001&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> $P < 0.05$

<sup>b</sup> $P < 0.01$

<sup>c</sup> $P < 0.001$
**TABLE 6**

**Significant Tukey (b) Multiple Comparisons of Occupational Group Means on VPI Scales**

<table>
<thead>
<tr>
<th>Scale</th>
<th>$\rho &lt; 0.05$</th>
<th>$\rho &lt; 0.01$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>Assemblers vs. Clerk-typists</td>
<td></td>
</tr>
<tr>
<td>Artistic</td>
<td>Floral Designers vs. Salespersons</td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>Ward Attendants vs. Salespersons</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ward Attendants vs. Floral Designers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ward Attendants vs. Laboratory Technicians</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ward Attendants vs. Clerk-typists</td>
<td></td>
</tr>
</tbody>
</table>
ward attendants and all other groups except assemblers. The ward
attendants-salespersons difference was also significant
at the .01 level.

A similar presentation of Tukey (b) comparisons for SDS
scales appears in Table 7. On the SDS Realistic Scale at the .05
level, both assemblers and laboratory technicians differed signifi-
cantly from both clerk-typists and floral designers. Also signifi-
cant at $p<.05$ were the pairs assemblers vs. salespersons and ward
attendants vs. clerk-typists. The differences between assemblers
vs. clerk-typists and between laboratory technicians vs. clerk-
typists were both significant at $p<.01$. Lab technicians differed
significantly from all other groups at both the .05 and .01 levels
on the Investigative Scale comparisons. At the .05 level on the
Artistic Scale, salespersons differed significantly from both
ward attendants and floral designers. The latter difference was
also significant at $p<.01$. Comparisons of Social Scale means
showed $p<.05$ differences between salespersons and both assemblers
and ward attendants. Neither difference was retained at the
.01 level. Floral designers differed significantly from four
groups at $p<.05$ on the Enterprising Scale -- laboratory technicians,
ward attendants, assemblers, and clerk-typists. Both salespersons
and clerk-typists also differed from laboratory technicians at
that level. Differences between floral designers vs. lab tech-
nicians, ward attendants, and assemblers as well as the salespersons
<table>
<thead>
<tr>
<th>Scale</th>
<th>$\rho &lt; 0.05$</th>
<th>$\rho &lt; 0.01$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>Ward Attendants vs. Clerk-typists</td>
<td>Laboratory Technicians vs. Clerk-typists</td>
</tr>
<tr>
<td></td>
<td>Laboratory Technicians vs. Clerk-typists</td>
<td>Laboratory Technicians vs. Clerk-typists</td>
</tr>
<tr>
<td></td>
<td>Assemblers vs. Clerk-typists</td>
<td>Assemblers vs. Clerk-typists</td>
</tr>
<tr>
<td></td>
<td>Laboratory Technicians vs. Floral Designers</td>
<td>Laboratory Technicians vs. Floral Designers</td>
</tr>
<tr>
<td></td>
<td>Assemblers vs. Floral Designers</td>
<td>Laboratory Technicians vs. Floral Designers</td>
</tr>
<tr>
<td></td>
<td>Assemblers vs. Salespersons</td>
<td>Laboratory Technicians vs. Salespersons</td>
</tr>
<tr>
<td>Investigative</td>
<td>Laboratory Technicians vs. Floral Designers</td>
<td>Laboratory Technicians vs. Floral Designers</td>
</tr>
<tr>
<td></td>
<td>Laboratory Technicians vs. Clerk-typists</td>
<td>Laboratory Technicians vs. Clerk-typists</td>
</tr>
<tr>
<td></td>
<td>Laboratory Technicians vs. Salespersons</td>
<td>Laboratory Technicians vs. Salespersons</td>
</tr>
<tr>
<td></td>
<td>Laboratory Technicians vs. Ward Attendants</td>
<td>Laboratory Technicians vs. Ward Attendants</td>
</tr>
<tr>
<td></td>
<td>Laboratory Technicians vs. Assemblers</td>
<td>Laboratory Technicians vs. Assemblers</td>
</tr>
<tr>
<td>Artistic</td>
<td>Ward Attendants vs. Salespersons</td>
<td>Floral Designers vs. Salespersons</td>
</tr>
<tr>
<td>Social</td>
<td>Assemblers vs. Salespersons</td>
<td>Floral Designers vs. Salespersons</td>
</tr>
</tbody>
</table>
|              | Ward Attendants vs. Salespersons                            | Ward Attendants vs. Salespersons                            | continued
TABLE 7 concluded

Significant Tukey (b) Multiple Comparisons of Occupational Group Means on SDS Scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>$p &lt; 0.05$</th>
<th>$p &lt; 0.01$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprising</td>
<td>Clerk-typists vs. Laboratory Technicians</td>
<td>Salespersons vs. Laboratory Technicians</td>
</tr>
<tr>
<td></td>
<td>Salespersons vs. Laboratory Technicians</td>
<td>Floral Designers vs. Laboratory Technicians</td>
</tr>
<tr>
<td></td>
<td>Floral Designers vs. Ward Attendants</td>
<td>Floral Designers vs. Ward Attendants</td>
</tr>
<tr>
<td></td>
<td>Floral Designers vs. Assemblers</td>
<td>Floral Designers vs. Assemblers</td>
</tr>
<tr>
<td></td>
<td>Floral Designers vs. Clerk-typists</td>
<td>Floral Designers vs. Clerk-typists</td>
</tr>
<tr>
<td>Conventional</td>
<td>Clerk-typists vs. Laboratory Technicians</td>
<td>Clerk-typists vs. Laboratory Technicians</td>
</tr>
<tr>
<td></td>
<td>Clerk-typists vs. Ward Attendants</td>
<td>Clerk-typists vs. Ward Attendants</td>
</tr>
<tr>
<td></td>
<td>Clerk-typists vs. Floral Designers</td>
<td>Clerk-typists vs. Floral Designers</td>
</tr>
<tr>
<td></td>
<td>Clerk-typists vs. Assemblers</td>
<td>Clerk-typists vs. Assemblers</td>
</tr>
<tr>
<td></td>
<td>Clerk-typists vs. Salespersons</td>
<td>Clerk-typists vs. Salespersons</td>
</tr>
<tr>
<td></td>
<td>Clerk-typists vs. Salespersons</td>
<td>Clerk-typists vs. Salespersons</td>
</tr>
</tbody>
</table>
vs. lab technicians difference remained significant at $p<.01$.

Finally, all groups differed significantly from clerk-typists at both the .05 and .01 levels on mean comparisons of the SDS Conventional Scale. Investigation of the scale completed the Tukey (b) comparisons and the main analyses of Hypothesis 1 concerning differences among group means.

A secondary inquiry concerned the patterns of scoring revealed by ranking group means from lowest (1) to highest (6) for each scale of each instrument. Table 8 contains these ranks. It should be observed that very strict differentiation among mean ranks is to be avoided due to the limits of the data occasioned by small Ns. The significance of differences among these ranks has already been operationalized via the Tukey (b) comparisons.

For both the VPI and the SDS Realistic Scales, the mean of assemblers’ scores ranked highest as expected (see discussion of expected high scoring in Chapter V), and the clerk-typists ranked lowest. Although no other group maintained the same rank for both instruments, the general patterns of scoring were similar with all other groups varying by only one rank from test to test.

Much more variability is seen in mean ranks on the Investigative Scales. Ward attendants ranked highest and clerk-typists ranked lowest on the VPI while lab technicians ranked highest and floral designers ranked lowest on the SDS. No one group's means
TABLE 8
Occupational Groups Ranked by Mean Size on Corresponding VPI and SDS Scales

<table>
<thead>
<tr>
<th>REALISTIC SCALES</th>
<th>INVESTIGATIVE SCALES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VPI</td>
</tr>
<tr>
<td>Assemblers*</td>
<td>6</td>
</tr>
<tr>
<td>Laboratory Technicians</td>
<td>3</td>
</tr>
<tr>
<td>Floral Designers</td>
<td>4</td>
</tr>
<tr>
<td>Ward Attendants</td>
<td>5</td>
</tr>
<tr>
<td>Salespersons</td>
<td>2</td>
</tr>
<tr>
<td>Clerk-typists</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ARTISTIC SCALES</th>
<th>SOCIAL SCALES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VPI</td>
</tr>
<tr>
<td>Assemblers</td>
<td>3</td>
</tr>
<tr>
<td>Laboratory Technicians</td>
<td>4</td>
</tr>
<tr>
<td>Floral Designers*</td>
<td>6</td>
</tr>
<tr>
<td>Ward Attendants</td>
<td>5</td>
</tr>
<tr>
<td>Salespersons</td>
<td>1</td>
</tr>
<tr>
<td>Clerk-typists</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ENTERPRISING SCALES</th>
<th>CONVENTIONAL SCALES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>VPI</td>
</tr>
<tr>
<td>Assemblers</td>
<td>5.5</td>
</tr>
<tr>
<td>Laboratory Technicians</td>
<td>1</td>
</tr>
<tr>
<td>Floral Designers</td>
<td>5.5</td>
</tr>
<tr>
<td>Ward Attendants</td>
<td>2</td>
</tr>
<tr>
<td>Salespersons*</td>
<td>3.5</td>
</tr>
<tr>
<td>Clerk-typists*</td>
<td>3.5</td>
</tr>
</tbody>
</table>

1 High = 6, Low = 1
2 * = group expected to rank high (6) on a given scale
ranked the same on both instruments.

The Artistic Scales evidenced almost complete agreement. Only the second and third ranks -- occupied by clerk-typists and assemblers, respectively -- on the VPI were reversed on the SDS. All other group means ranked identically.

All rankings on the Social Scales were also identical with the exception of the third and fourth positions. On the VPI, lab technicians placed third and clerk-typists placed fourth. These rankings were reversed on the SDS.

The ranking of means on the Enterprising Scales was complicated by the fact that some VPI means are very close in value. By carrying the computation of means out to several decimal places, the computer was able to order group means on the VPI as follows: 6,1,5,2,3,4. Yet the low N would seem to render such fine differences somewhat meaningless. For this reason, two ties are indicated in the VPI rankings, 3-4 and 5-6. The lowest two ranks were identical on both instruments, and positions four and six were similar. A generally similar pattern of ranks emerged.

Finally, on the Conventional Scales, three groups maintained the same rank across both instruments. Considerable variability was exhibited by the other three groups.
In summary, the secondary inquiry found that rank orders of group means were almost identical for the VPI and SDS Artistic Scales and for the VPI and SDS Social Scales. General similarity of patterns was found for both Enterprising Scales. Considerable variability existed between the two Investigative Scales and between the two Conventional Scales.

HYPOTHESIS 2

Significant differences among the mean scores of the six occupational groups (assemblers, laboratory technicians, floral designers, ward attendants, salespersons, and clerk-typists) are not expected on the satisfaction item of the Biographical Data Sheet (see Item #8, Appendix A).

Analyses in this section relate to the significance of differences among the mean scores of the six occupational groups on the satisfaction item. Table 9 contains the means and standard deviations of the groups on this item. The univariate analysis of variance was significant, $F(5, 108) = 2.6568$, $p<.05$. Tukey (b) multiple comparisons yielded one pair of means significantly different at the .05 level, ward attendants vs. assemblers, and no significant differences at $p<.01$. Ward attendants were significantly more satisfied than assemblers.
TABLE 9
MEANS AND STANDARD DEVIATIONS OF OCCUPATIONAL GROUP SCORES ON SATISFACTION ITEM

<table>
<thead>
<tr>
<th>Group</th>
<th>Mean</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assemblers</td>
<td>2.421</td>
<td>0.8377</td>
</tr>
<tr>
<td>Laboratory</td>
<td>3.000</td>
<td></td>
</tr>
<tr>
<td>Technicians</td>
<td>0.8452</td>
<td></td>
</tr>
<tr>
<td>Floral</td>
<td>3.211</td>
<td></td>
</tr>
<tr>
<td>Designers</td>
<td>0.7133</td>
<td></td>
</tr>
<tr>
<td>Ward</td>
<td>3.450</td>
<td></td>
</tr>
<tr>
<td>Attendants</td>
<td>1.1459</td>
<td></td>
</tr>
<tr>
<td>Salespersons</td>
<td>2.900</td>
<td>1.0711</td>
</tr>
<tr>
<td>Clerk-Typists</td>
<td>2.952</td>
<td>0.8646</td>
</tr>
</tbody>
</table>

HYPOTHESIS 3

Significant differences are expected between the mean scores of congruent and incongruent subjects on the satisfaction item of the Biographical Data Sheet (see Item #8, Appendix A).

Congruence was defined as the matching of a subject's personal orientation with the Holland environment represented by her occupation. Each subject was designated as either congruent or
incongruent according to her highest scale score on the VPI and again as congruent or incongruent according to her highest scale score on the SDS. Results for each inventory were considered separately using a one-tailed t-test to compare congruent and incongruent Ss with respect to mean satisfaction scores. The percent of congruent Ss, as defined by the VPI, for each occupational group was as follows: Realistic, 16%; Investigative, 33%; Artistic, 45%; Social, 60%; Enterprising, 20%; and Conventional, 24%. These congruent Ss were significantly (p<.05) more satisfied than incongruent Ss. The percent of congruent Ss, as defined by the SDS for each occupational group was as follows: Realistic, 0%; Investigative, 33%; Artistic, 20%; Social, 80%; Enterprising, 35%; and Conventional, 57%. These congruent Ss were more satisfied than incongruent Ss, but this difference was not significant (p>.05).

HYPOTHESIS 4

The six scales of the Vocational Preference Inventory and the six scales of the Self-Directed Search bearing the same name (Realistic, Investigative, Artistic, Social, Enterprising, and Conventional) are expected to be positively and significantly correlated.

Analysis in this final section pertains to the relationships between same-named scales on the VPI and the SDS. Results of the Pearson product-moment correlation coefficients appear in the Table 10 matrix. Correlations between the Realistic Scales,
TABLE 10
Correlation Coefficients for the Same-Named Scales of the VPI and the SDS

<table>
<thead>
<tr>
<th>SDS</th>
<th>Realistic</th>
<th>Investigative</th>
<th>Artistic</th>
<th>Social</th>
<th>Enterprising</th>
<th>Conventional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>0.3900&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.0665</td>
<td>-0.1695</td>
<td>0.0081</td>
<td>-0.0942</td>
<td>0.0596</td>
</tr>
<tr>
<td>Investigative</td>
<td>0.0782</td>
<td>0.3877&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.0302</td>
<td>0.0119</td>
<td>-0.2171&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.1265</td>
</tr>
<tr>
<td>Artistic</td>
<td>0.1153</td>
<td>0.1540</td>
<td>0.6050&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.0394</td>
<td>0.0287</td>
<td>-0.2495&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Social</td>
<td>0.0943</td>
<td>-0.0522</td>
<td>0.0075</td>
<td>0.5071&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.1746</td>
<td>0.0578</td>
</tr>
<tr>
<td>Enterprising</td>
<td>-0.0539</td>
<td>-0.0955</td>
<td>0.1593</td>
<td>0.0354</td>
<td>0.4537&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.1207</td>
</tr>
<tr>
<td>Conventional</td>
<td>-0.2694&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-0.2694&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-0.3762&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-0.0574</td>
<td>-0.0086</td>
<td>0.2611&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> \( p < 0.05 \)

<sup>b</sup> \( p < 0.01 \)

<sup>c</sup> \( p < 0.001 \)
the Investigative Scales, the Artistic Scales, the Social Scales, and the Enterprising Scales were all significant at $p<.001$. The Conventional Scales correlated significantly at the .01 level. However, these correlations appear to be only moderate in magnitude.
CHAPTER V

DISCUSSION

This research consisted of three main analyses. The first examined the concurrent validity of Holland's vocational theory by testing whether differences in occupational group membership were reflected in a predictable way by differences in personal orientation measured by the six occupational scales of the Vocational Preference Inventory and the six summary scales of the Self-Directed Search (Hypothesis 1). Second, a tentative investigation was made of job satisfaction through occupational group differences and through congruence, the matching or non-matching of person to job in terms of Holland categories (Hypotheses 2 and 3). Finally, the relationship of the VPI and the SDS was considered (Hypothesis 4). Of special interest throughout the study was the nature of the subjects, volunteer non-college-degreed working women. Discussion of the results is organized around these three analyses.
TEST OF CONCURRENT VALIDITY

The hypothesis that significant differences would be observed among the mean scores of the six occupational groups was supported for the SDS but only partially for the VPI. A highly significant ($p<.001$) multivariate test for the main effect of occupational groups tended to provide initial support for the expectation of predictable occupational group differences across both inventories. Refinement of this result through univariate analyses of variance of each relevant scale of each inventory (Tables 4 and 5) indicated that all six SDS scales and three VPI scales -- Realistic, Artistic and Social -- achieved significance (.05 level in this study). Such an outcome means that the occupational groups scored systematically differently on the significant scales, thus further supporting the hypothesized fact of such differences. Considerable evidence was gained here for the discriminant power of the SDS and less for that of the VPI.

Finally, the occupational group sources of scoring differences were pinpointed through post hoc Tukey (b) multiple paired comparisons (Tables 6 and 7). Data on whether the expected group peaked on each scale appears in Table 11, derived from Holland's theory and inspection of the group means in Tables 2 and 3. The occupational group representing a particular Holland environment is expected to score highest and be differentiated from all other...
### TABLE 11

Expected and Observed Scoring of Occupational Group Means on VPI and SDS Scales

<table>
<thead>
<tr>
<th>Scale</th>
<th>Expected Highest Group</th>
<th>Observed Highest Group</th>
<th>Observed Second-Highest Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Realistic</td>
<td>Assemblers</td>
<td>Assemblers</td>
<td>Ward Attendants</td>
</tr>
<tr>
<td>Investigative</td>
<td>Laboratory Technicians</td>
<td>Ward Attendants</td>
<td>Laboratory Technicians</td>
</tr>
<tr>
<td>Artistic</td>
<td>Floral Designers</td>
<td>Floral Designers</td>
<td>Ward Attendants</td>
</tr>
<tr>
<td>Social</td>
<td>Ward Attendants</td>
<td>Ward Attendants</td>
<td>Assemblers</td>
</tr>
<tr>
<td>Enterprising</td>
<td>Salespersons</td>
<td>Assemblers/ Floral Designers</td>
<td></td>
</tr>
<tr>
<td>Conventional</td>
<td>Clerk-typists</td>
<td>Assemblers</td>
<td>Salespersons</td>
</tr>
<tr>
<td>Realistic</td>
<td>Assemblers</td>
<td>Assemblers</td>
<td>Laboratory Technicians</td>
</tr>
<tr>
<td>Investigative</td>
<td>Laboratory Technicians</td>
<td>Laboratory Technicians</td>
<td>Assemblers</td>
</tr>
<tr>
<td>Artistic</td>
<td>Floral Designers</td>
<td>Floral Designers</td>
<td>Ward Attendants</td>
</tr>
<tr>
<td>Social</td>
<td>Ward Attendants</td>
<td>Ward Attendants</td>
<td>Assemblers</td>
</tr>
<tr>
<td>Enterprising</td>
<td>Salespersons</td>
<td>Floral Designers</td>
<td>Salespersons</td>
</tr>
<tr>
<td>Conventional</td>
<td>Clerk-typists</td>
<td>Clerk-typists</td>
<td>Salespersons</td>
</tr>
</tbody>
</table>
occupational groups on the VPI and SDS scales measuring the corresponding personal orientation. Whether groups did peak appropriately is easily ascertained, but the patterns of group differentiation revealed by significant Tukey (b) results are difficult to interpret. This difficulty, in fact, accounts for the use of post hoc rather than a priori comparisons and results from the use of Ss from only one occupation to represent each occupational category, the relatively unknown response patterns of the kinds of Ss chosen, the small group Ns, and problems of interpretation based on Holland's hexagonal model. Scoring differences that might be expected according to the model are modified by the specific combination of environments in the Holland codes for the occupations used in the study.

On the VPI, three scales -- Investigative, Enterprising, and Conventional -- failed to attain significance and thus automatically failed to achieve significant differences in occupational group scoring. Table 8 indicates further that lab technicians ranked second in mean scoring on the Investigative Scale, a result that is not statistically significant but tends to support expectation. Contrary to expectation, salespersons and clerk-typists did not rank either first or second on the Enterprising and Conventional Scales, respectively. Expected high group ranking was observed for the other three VPI scales. The fact of their significance also indicates the presence of
significant differences in scoring between specific groups. On the Realistic Scale, assemblers ranked highest and were significantly different from clerk-typists. Floral designers peaked on the Artistic Scale, and salespersons scored significantly differently from them. The high group on the Social Scale, ward attendants, were differentiated from all other groups except assemblers.

To summarize, for three of the six VPI scales, expected groups scored the highest mean; and for one scale, the expected group scored the second highest mean. None of the significant differences in group scoring is interpretable via the hexagonal model.

For the SDS, Table 11 indicates that expected groups scored highest on all scales except the Enterprising Scale. These results are statistically significant as are various differences in group scoring for each scale. Assemblers peaked on the Realistic Scale and were different from clerk-typists, floral designers, and salespersons. Most of the six pairs of significant differences are predictable according to the hexagonal model. On the Investigative Scale, laboratory technicians, as high scorers, were successfully differentiated from all other groups. A similar result was obtained for clerk-typists and the Conventional Scale. Such results indicate great discriminatory power of these two scales in this study. Floral designers ranked high on the Artistic Scale, with salespersons scoring significantly differently from them and from ward attendants. The former difference conforms to the
hexagonal model; the latter does not. Finally, on the Social Scale, ward attendants appropriately ranked high. Again salespersons differed from them and from assemblers. The salesperson-assembler difference follows the hexagonal model. The Enterprising Scale, while significant, does not yield the expected group, salespersons, as high scorer. Instead floral designers peak with salespersons ranking second high. There is no significant difference between the two groups. It is understandable that floral designers, like many others in artistic occupations, might be oriented toward Enterprising interests since they must often personally sell the work they create. Four of the six significant scoring differences for this scale are between floral designers and other groups, and four of the six differences are interpretable according to the hexagonal model. In summary, SDS means established that expected groups scored highest on five of six scales. Means on the sixth scale placed the expected group at the second highest rank. Many significant scoring differences occurred as would be expected via the hexagonal model. The Investigative and Conventional Scales differentiated among all occupational groups. More expected and more easily interpretable scoring was evidenced on the SDS than on the VPI. The Enterprising Scale did not achieve expected scoring on either inventory.

These results compare to other research in interesting ways. Both Fishburne (1973) and O'Brien (1975) investigated
non-college-degreed men. Neither study supported the concurrent validity of the VPI Investigative Scale. The O'Brien result is especially relevant since his Investigative sample were Black male lab and x-ray technicians. Additionally, Fishburne, like this study, found little support for the VPI Enterprising Scale and generally concluded that the SDS was more useful than the VPI with his sample. The two instruments were more equally successful for O'Brien's and Horton's (1975) results with college-degreed women. In contrast with this study, every scale of the VPI and the SDS attained significance and the mean of almost every occupational group peaked or was statistically indistinguishable from the highest mean on the appropriate scale. For whatever reasons, then, differences in women's education level, occupation level, and therefore probably SES level seem associated with differences in scoring, especially on the VPI.

As an aside in considering the VPI results, it is reasonable to assume that the responses of an S to an inventory can be affected by how the S feels about the inventory. Some work has been done on the satisfaction of users of the SDS. Collins and Sedlacek (1972) investigated 4,631 college freshmen of whom 193 males and 292 females reported satisfaction with the SDS. Significantly more dissatisfied users than satisfied ones received summary codes for which there were no corresponding occupation in the Occupations Finder. It would be interesting to take a
similar look at the VPI. In the present study, two Ss complained that they were only interested in their own job and it was not listed on the VPI. Two groups for whom the corresponding VPI scale achieved significance (assemblers, Realistic Scale, and floral designers, Artistic Scale) did not find their specific occupation listed, so nothing definitive is indicated. Yet a close look at the VPI occupations is suggestive. The Investigative scale is composed of 14 occupations, 12 of which are at the highest position on Hollingshead's occupation scale and require a college degree and usually graduate training. The other two items are at the second highest occupation scale position and require some college. There may be little in this scale for SES Levels III and IV non-professional workers to identify with.

One problem with high SES items and lower SES subjects is the question of set when taking the test. The VPI test sheet includes the title, Vocational Preference Inventory, which may sound as if a vocational choice is requested, while the test instructions ask for responses according to vocational interest. Lewis and Sedlacek (1972) have demonstrated a significant difference in SDS daydream codes and summary codes for subjects with low parental education level, a correlate of low SES level. Another kind of difference between interests and choices is reflected by Gottfredson, Holland and Gottfredson's (1975) comparison of girls' SDS-measured aspirations and Bureau of Census women's
employment records for the education levels of high school and above. There are many important discrepancies. Therefore, Ss responses to the VPI, particularly those on the lower SES continuum, might be different according to how the person interpreted the instruction. This would be especially true is the S felt that the task requested is expressed vocational choice, and the occupations the person would actually indicate as choices are not listed.

Beyond the relationships of SES level of VPI occupations, SES level of subject, and test sets, there remains another aspect to the problem of not finding one's own preferred occupation listed. Statistics indicate that a high proportion of women are employed in a few occupations, many of them at low occupation levels and most of them traditionally feminine. To an extent the women in this study may be representative of the typical female worker. Yet how many of these very common jobs are included in the VPI? Of course the VPI was carefully and empirically constructed with an effort to maximize item-scale correlations and discrimination among scales. It is also true that many professionals support attempts to give women the opportunity to express interests in non-traditional jobs. Yet Campbell and Harmon (1968) investigated and found justification for non-professional SVIB scales that more accurately reflect the professional - non-professional continuum for women. The real point here is the
impact on non-college-degreed employed women of an inventory composed of many job titles that may bear a limited relation to their situation.

TEST OF SATISFACTION

The hypothesis that no significant differences in mean scoring on the satisfaction item would be observed among the six occupational groups was not supported. Ward attendants were significantly more satisfied than assemblers. Such a difference was not expected because only Ss who had been employed in the current job for at least a year were included in the study. Still, given only one such difference, it seems doubtful that group variations in satisfaction are reflected in the other results in this study. The hypothesis that congruent Ss are expected to be significantly more satisfied than incongruent Ss was supported for the VPI but not for the SDS. This is partially in line with J. Werner's (1969) negative and inconclusive results and generally adds depth to the body of research already mentioned yielding high satisfaction for congruent women students. These results can be considered in a number of ways.

Measurement is a potential problem with such outcomes. For example, what is meant by satisfaction? Most people (Crites, 1969) and most women (U. S. Department of Labor, 1975) say they are satisfied with their jobs. The assemblers who were significantly
less satisfied than attendants in this study had logged a mean of 5.24 years in that occupation. The ultimate goal of such a theory as Holland's is to develop a system whereby "satisfaction" is maximized for the employee and "achievement and productivity" are maximized for the employer. There is some assumption that satisfaction in terms of Holland's ideas is some kind of fulfillment related to personality characteristics or at least a feeling of a job well done. The latter is supported by Wolfe's (1969) result that women work for achievement and social values. Yet most of the women in this study say they are in their jobs by chance, and many are the heads of their families. So security, pay levels and benefits may weigh heavily in their decision either to enter or to remain in a job no matter what intrapsychic feeling the job produces. Respecting the assemblers' results, a possible clue is provided by Anastasi's (1968) suggestion that interests are not as relevant as pay for lower level jobs or Sweet's (1973) observation that it is unlikely that women working on assembly lines or in other occupations available to women with less than a high school degree escape boredom or find fulfillment in their work. Perhaps some jobs do not satisfy workers, and perhaps some people work at jobs for reasons other than intrapsychic satisfaction, especially during the increasing unemployment of women since 1974. All of these factors have implications for the measurement of satisfaction.
With respect to congruence, there is an additional measurement problem -- that of the personality type and the occupational environment. Since incongruent Ss were as satisfied as congruent Ss defined by the SDS, it is possible to conclude that the idea of congruence lacks validity for this sample on that inventory. Possible difficulties with measuring personality type via the VPI have been mentioned although VPI congruence-satisfaction results were as expected. SDS difficulties could remain. Generally, Tyler's (1964) suggestion that interest tests measure the direction but not the strength of vocational interests might apply here. Also it is possible that individuals may be working at jobs that are congruent with their personality but that do not satisfy them due to faulty occupational stereotypes (Osipow, 1970; Elmendorf, 1973). Measurement of the environment is another part of defining congruence. Since many of the occupational codes listed by *The Occupations Finder* are a priori or have been tested on groups of employed men, and since Prediger and Hanson (1976a) found that many men and women in Project Talent data who worked in the same occupation received different Holland codes, it is possible to ask whether the code of an occupational environment may be different for equally happy men and women (Horton, 1975). Thus incongruent (as currently measured) women might be happy in their work and still explainable by the theory. Finally, Roe and Klos (1969) suggest that the psychological distance
between occupations decreases at the lower levels, so environmental definitions may be more imprecise. Only research can settle these questions, but the answers affect congruence results.

In a final look at the assembler-attendant difference, the disproportionate percentage of aspirations to Social jobs (66%) of girls compared to the percentage of women actually employed in Social jobs (23%) (Gottfredson, Holland and Gottfredson, 1975) means that many more women want to work in Social jobs than there are jobs available. The converse is true for Realistic jobs. Fewer girls aspire to them (0.6%) than women work in them (17.9%). There are problems with this data, but the general trend is relevant here.

Measurement of employees' satisfaction is really incomplete without a corresponding measure of their achievement and productivity beyond participation in the occupation for a minimum length of time. A good estimate of both satisfaction and achievement are needed to begin evaluation of congruence.

TEST OF SAME-NA M ED SCALES

The hypothesis expecting that same-named scales of the VPI and the SDS would be positively and significantly correlated was supported. Although the magnitude of the correlations was only moderate, all were significant at \( p < .001 \) except the .01 level Conventional Scales (Table 10). This study provides a limited
degree of evidence for the idea that these scales are tapping common constructs, a result supported by others (Gaffey and Walsh, 1974; Fishburne, 1973; Horton, 1975; and O'Brien, 1975).
CHAPTER VI

CONCLUSIONS

SUMMARY

This study examined John Holland's (1973a) ideas that people tend to join occupational environments similar to their own personal orientations and that to the extent that an individual achieves a good fit between self and job, he or she is more satisfied. Operationally, groups of non-college-degreed women working as assemblers, lab technicians, floral designers, ward attendants, salespersons, and clerk-typists participated as representatives of Holland's Realistic, Investigative, Artistic, Social, Enterprising, and Conventional environments, respectively. These 114 women were at least 18, had no more than two years of college, and had worked at their present job for at least one year. Each volunteer responded to Holland's inventories, the Vocational Preference Inventory and the Self-Directed Search, measuring his six corresponding personality orientations and to a biographical questionnaire (Appendix A). It was predicted (a) that the Realistic,
Investigative, Artistic, Social, Enterprising, and Conventional Scales of the two instruments would significantly discriminate among subject group means in accordance with Holland's theory; (b) that groups would evidence no significant differences in mean satisfaction; (c) that congruent Ss (those whose highest mean score occurred on the scale matching their environmental type) would be significantly more satisfied than incongruent Ss; and (d) that scales with the same name on each inventory would be positively and significantly correlated.

Initially a multivariate analysis across the 12 scales of the two inventories tested the main effect of occupational groups. The highly significant result justified univariate analyses of variance for each of the 12 scales. An additional univariate analysis of variance was conducted for the group satisfaction results. Tukey (b) post hoc pairwise multiple comparisons tested significant outcomes to locate the sources of significance. The mean satisfaction of congruent and incongruent Ss as defined by each inventory was compared for significant differences by a one-tailed t-test. Finally, Pearson product-moment correlations probed scale-scale association.
MAJOR FINDINGS

Test of Concurrent Validity

Outcomes. Results from the multivariate analysis, the univariate analyses of variance and the subsequent Tukey (b) multiple comparisons for the six vocational scales of the Vocational Preference Inventory and the six summary scales of the Self-Directed Search follow:

1. Highly significant ($p<.001$) occupational group differences across the 12 scales were indicated.

2. The occupational groups were significantly differentiated at $p<.05$ on the Realistic and Artistic Scales and at $p<.01$ on the Social Scale of the VPI.

3. The occupational groups were not significantly differentiated ($p>.05$) on the Investigative, Enterprising, and Conventional Scales of the VPI.

4. The appropriate occupational groups were significantly differentiated ($p<.05$ or less) on the Realistic, Artistic, and Social Scales of the VPI but not on the Investigative, Enterprising or Conventional Scales.

5. The occupational groups were significantly differentiated on each of the six SDS scales at $p<.001$ for the Realistic, Investigative, Artistic, Enterprising, and Conventional Scales, and $p<.01$ for the Social Scale.

6. The appropriate occupational groups were significantly differentiated ($p<.05$ or less) on the Realistic, Investigative, Artistic, Social, and Conventional Scales of the SDS but not on the Enterprising Scale.

Conclusions. Outcomes 1, 2, 3, and 4 indicate that three scales of the VPI discriminate the occupational groups of this
sample more effectively than the other three. This finding tentatively suggests that the concurrent validity may vary from scale to scale depending on the occupations and perhaps education level of the sample involved. Outcomes 1, 5, and 6 indicate strong support for the concurrent validity of the SDS.

Test of Satisfaction

**Outcomes.** Results from the univariate analysis of variance and the test of the congruence-satisfaction hypothesis for both the VPI and the SDS follow:

1. The occupational groups were significantly differentiated ($p<.05$) on the satisfaction item.

2. Ward attendants were significantly ($p<.05$) higher than assemblers on mean satisfaction.

3. Congruent Ss as defined by the VPI were significantly higher ($p<.05$) than incongruent Ss on mean satisfaction, while congruent Ss as defined by the SDS were not significantly higher ($p>.05$) than incongruent Ss on mean satisfaction.

**Conclusions.** Outcomes 1 and 2 indicate that only ward attendants and assemblers of all occupational groups were significantly different in mean satisfaction and that attendants were the more satisfied of the two. While this particular significant difference can be explained in several different ways (see Chapter V), it seems unlikely that the tests of concurrent validity were systematically affected by this single $p<.05$ satisfaction difference. Outcome 3 indicates some support for Holland's congruence-satisfaction hypothesis using the VPI but not using the SDS.
Test of Same-Named Scales.

Outcome. Results of the correlation of VPI and SDS scales bearing the same name yielded moderate, positive, and significant coefficients for all pairs. The significance level was .001 for all pairs except the Conventional Scales (.01).

Conclusion. This outcome indicates tentative support for the idea that identical constructs underlie same-named scales.

LIMITATIONS

This study is limited by several factors, notably the small sample size, the use of only one occupation to represent each Holland environment, possible geographic differences in the sampling, and the use of a highly select sample, working women with no college degree. No attempt was made to study possible response differences of the few Black and Chicano women who were included. For all these reasons, generalization of the concurrent validity and scale-scale correlations results cannot be extended to the entire population of the occupations studied here and inferences about Holland's theory applied to full-time working women without college degrees need further clarification. It is possible, although unlikely, that these results were systematically affected by differences in occupational group satisfaction.

Secondly, results testing the congruence-satisfaction hypothesis must be interpreted with care due both to the variables
above and to a possible lack of needed refinement in measuring the definitive components.

Additionally, this study is cross-sectional. Thus, despite the inclusion of a wide age range of subjects, its outcomes cannot be used to discuss the development of Holland's personal orientations beyond mention of anecdotal information reported by Ss on how they arrived at their current job choice.

Finally, no measure of sex-role ideology was included in any investigation although some attempt was made to secure Ss from occupations typical of women. Such a measure might have correlated with satisfaction or other results, and it might be useful in examination of this kind of S working in less traditionally feminine occupations. Similarly, it is important to remember the rise in unemployment rate for minorities and women that began in 1974 and extended through the period of data collection. Such economic conditions may have encouraged women to remain in a job or to accept a job that did not initially interest or eventually really satisfy them.

IMPLICATIONS

Generally, this study supports the concurrent validity of Holland's vocational theory as applied to non-college-degreed women who work full-time. It adds power to the support already generated for non-college degree working samples by Fishburne
above and to a possible lack of needed refinement in measuring the definitive components.

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IMPLICATIONS

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Further investigation could be made of other occupations for similar samples and of samples of Chicano males and females, Black females, many classifications of females working in parttime jobs, and males and females working in less stereotypically sex-role appropriate jobs. The need to investigate workers at different education and socioeconomic levels was reinforced by differences in the results of this study and those of Horton's (1975) study of college-degreed women. His groups of professional women were more clearly differentiated by Holland's theory. In addition to education and socioeconomic status, other possible key variables in such differences could be the particular occupations tested, the sex-role ideology of the women, and general differences between professional and non-professional occupations.

More support was evidenced for the validity of the Self-directed Search with this sample than that of the Vocational Preference Inventory. Fishburne's (1973) but not O'Brien's (1975) results agree. Until this result is clarified perhaps counselors should not rely only on VPI results with non-college-educated clients. The hexagonal model was difficult to use in interpretation of group differences. Further investigation could be made of the satisfaction of low SES users with the VPI in view of the fact that the VPI and the SDS were about equally effective for high SES men (Gaffey, 1972) and women (Horton, 1975).
The conclusion that same-named VPI and SDS scales measure identical constructs can only be tentatively drawn due to the moderate magnitude of the correlations. Few implications can be drawn from this data.

The tentative probe of satisfaction accruing from the congruence of key aspects of employee and employment found some support for definitions using the SDS. The congruence-satisfaction hypothesis is a persuasive idea and one that relates to important goals of vocational services. Refinement of the measurement of personality, environment, and satisfaction would be useful. Further investigations might use congruence among other variables as a subject requirement and then study satisfaction, stability, and achievement, or use satisfaction, achievement and stability as subject requirements and then study congruence.

This study contributes a share to the importance of socio-economic status as a variable in occupational research. The influence of SES in investigations of women has been and will continue to be problematic as women seek independent status through ever higher education and occupational aspiration levels but due to cultural and economic conditions will probably not attain it (U. S. Department of Labor, 1975; Blake, 1974).
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APPENDIX A

BIOGRAPHICAL DATA SHEET
1. Please give the title of your present job (be specific): ________________________

2. Please describe your present job briefly: __________________________________________

3. Length, in years, of employment in present job: ________________________________

4. Last school grade you completed (please place an X on appropriate line):
   ____ 1-6   ____ Some college but less than 1 year
   ____ 7-9   ____ 1-2 years of college
   ____ 10-12  ____ 3-4 years of college
   If you attended college, please give the name of the college:
   __________________________________________________________

5. Total length of employment in your present occupation (if you have changed jobs but all jobs have been the same but for different employers, count that as the total time). (Place an X on the appropriate line):
   ____ Less than 1 year   ____ 4 years
   ____ 1 year   ____ 5 years
   ____ 2 years   ____ 6-10 years
   ____ 3 years   ____ More than 10 years

6. Employment, for a period of six months or more, in an occupation(s) other than your present occupation (place an X on the appropriate line):
   ____ I have never been employed in an occupation other than the one in which I am now employed.
   ____ 1 other occupation   ____ 3 other occupations
   ____ 2 other occupations   ____ More than 3 others
   If you have been employed in another occupation, please list the last occupation you were employed in prior to the occupation you are presently in (give specific job title):
   __________________________________________________________
7. How did you select your current occupation (place an X by each appropriate answer):

___ I had planned on going into this occupation when I was still in school
___ It was by chance that I am in this occupation
___ I considered other occupations before selecting the one I am in now
___ Other (please describe) ________________________________

8. In comparison with other people, how satisfied are you with your job? (Place an X on the appropriate line):

___ Not satisfied (My job is much poorer than I would like it to be)
___ Only slightly satisfied (My job is not quite what I would like it to be)
___ Satisfied (My job is what I would like it to be)
___ Very satisfied (My job is even better than I expected it to be)
___ Extremely satisfied (My job is much better than I hoped it could be)

9. Age ______

10. Town or city where you grew up (went to grade school and/or high school):

11. Population size of that town or city (guess roughly): ______________

12. Current marital status (please place an X on the appropriate line):

___ Single      ___ Married       ___ Widowed
___ Divorced    ___ Separated

Please answer the following questions if they apply to you:

13. Number of children ______. Their ages ___________________________

14. Please give the title of your husband's present job:

15. Last school grade your husband completed:

___ 1-6       ___ Some college but less than 1 year
___ 7-9       ___ 1-2 years of college
___ 10-12     ___ 3-4 years of college