INVESTIGATION OF DIFFERENCES IN OCCUPATIONAL PREFERENCES, STEREOTYPIC THINKING, AND PSYCHOLOGICAL NEEDS AMONG UNDERGRADUATE WOMEN STUDENTS IN SELECTED CURRICULAR AREAS

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ABSTRACT

INVESTIGATION OF DIFFERENCES IN OCCUPATIONAL PREFERENCES, STEREOTYPIC THINKING, AND PSYCHOLOGICAL NEEDS AMONG UNDERGRADUATE WOMEN STUDENTS IN SELECTED CURRICULAR AREAS

by Robert E. Kittredge

The Problem

The study is exploratory in nature. The purpose is to investigate differences in occupational preferences, stereotypic thinking and psychological needs among undergraduate women.

Rationale

The theoretical framework of the study is based upon the propositions advanced by Super that (1) vocational development is one aspect of the larger phenomena of personal development and (2) vocational development constitutes an attempt by the individual to implement a self-concept. In this context certain relationships are expected among selected aspects of vocational and personal development.

A sociological dimension is introduced which attempts to account for differences in women's occupational preferences and ultimate vocational selection on the basis of fundamental sex-role differences. Women's occupational preferences are conceived as falling along a "traditional--non-traditional" continuum. Using this concept, an instrument, the Occupational Preference Sheet, was developed to measure the degree to which

women prefer traditional rather than less traditional occupations.

Design and Methodology

The final samples consisted of eighty-six women students from four curricular areas: home economics, medical technology, journalism-advertising, and mathematics-chemistry. They are listed in order from most to least traditional, with the first two representing traditional women's occupations and the latter two, less traditional women's occupations. The two non-traditional groups are combinations of related curricular areas due to the limited number of students available.

The instruments administered to the students were: (1) the Inventory of Beliefs--to measure stereotypic thinking, (2) the Edwards Personal Preference Schedule--to measure manifest needs, (3) the Occupational Preference Sheet--to measure preference for traditional as opposed to non-traditional occupations, and (4) a questionnaire designed to obtain information concerning family background, career and marriage plans, and opinion about women's work role.

Each of the nineteen items on the Occupational Preference Sheet contains three occupations, classified as "traditional," "less traditional" and "non-traditional." Categories were arrived at through use of Census figures and judgments of experienced college counselors.

Using analysis of variance technique, an internal consistency reliability estimate of .57 was obtained for the Occupational Preference Sheet. Construct and content validation were achieved in the construction of the instrument. Evidence of concurrent validity was obtained in the study.

Results

College women in the four curricular groups differ 1) significantly in their occupational preference. Students in traditional curricular groups tended to prefer traditional over less traditional occupations, while those in less traditional groups tended to prefer least traditional occupations, as predicted. F-test and "t" test were used.

College women in the four curricular groups differ significantly in the 2) degree to which they are stereotyped in their beliefs. The trend was noted for students in traditional curricular groups to be most stereotyped and those in less traditional groups, least stereotyped, even though some differences were not statistically significant. F-test and "t" test were used.

Among the four curricular groups studied there were no significant differences in mean scores on manifest needs: achievement, autonomy, dominance, endurance, aggression, deference, abasement and nurturance. F-test was used.

There is a very slight positive correlation between scores on the Inventory of Beliefs and the Occupational Preference Sheet. Product moment correlation used.

In analyzing questionnaire results it was found that women students who are most stereotyped in their beliefs and most traditional in their occupational preferences tend to share the opinion that a woman's place is only in the home. On the other hand, students who are least stereotyped and least traditional in their occupational preferences, tend to share the opinion that a woman's place can be both in the home and on the job. Chi square model was used.

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by

Robert E. Kittredge

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CHAPTER I

THE PROBLEM

The writer has observed, in his experience in a university counseling center, that students frequently raise questions pertaining to vocations -- what to choose as a major field of study, what occupation to choose, how to prepare for a certain type of work. The present study evolved from an interest in vocational counseling in a university setting.

Statement of the Problem

The major concern of this study is to investigate differences in stereotypic thinking, psychological needs and occupational preference among undergraduate women students in selected curricular areas.

Purpose of the Study

The more immediate purpose is to provide a better understanding of women's vocational development through an investigation of the relationship of certain personality variables to occupational preference and choice of major. Beyond this, it is an attempt to explore the theoretical proposition that vocational development is, in effect, only one aspect of an individual's total development and that, as such, it represents one of the several ways in which an individual attempts to implement his self concept. It is hoped the study will contribute to a general theory of women's vocational development.

Importance of the Study

The role that women in our society assume in the world of work has implications for every segment of the society. For this reason, the present study, which is designed to clarify certain aspects of women's work role, is considered to be vitally important. An attempt is made to demonstrate the importance of the study in the context of basic issues in our society -- the need for effective utilization of human resources, the inevitable discrepancy between cultural expectation and actual practice, the need for clarification of the goals of education for women, and the need for a vocational theory for women.

Effective Utilization of Human Resources

There is a great deal of emphasis at the moment on the effective utilization of manpower and womanpower resources to serve national interests as well as those of the individual. Womanpower (61), published as a result of a study by the National Manpower Council of the United States Department of Labor, reflects this growing emphasis. The study indicates that increasing numbers of women will enter the labor force in response to the demands of an expanding and constantly changing economy and stresses that attention needs to be directed toward appropriate utilization of this great potential.

Changes in Women's Roles

Articles dealing with men's and women's roles in contemporary American society appear regularly in the popular press and in professional publications. Some writers criticize women for their lack or loss of "femininity" and men for their decline in "masculinity." In rather sharp contrast, other writers and researchers approach the matter in a

rational and objective manner. Whatever the approach, it underscores the current concern with a subject which contains many real and potential conflict areas that are not easily resolved.

Although there are large numbers of women who work on a full or part-time basis, there is considerable conflict surrounding this aspect of women's role in our society. The nature and degree of the conflict depends on a variety of factors, including age, marital status, class, employer attitudes, parental expectations and attitudes, attitudes of husband and significant others concerning work, and last, but by no means of least importance, the way in which the individual woman perceives her role in society. It appears that much of this conflict results from the discrepancy between cultural expectation and what women actually do.

Education of Women

One out of every three individuals in the labor force of sixty million is a woman, and, as previously stated, the predications are that the number will increase in the future. This employment trend, together with the changes in women's roles and resulting conflicts, has broad implications for the education of women. It raises the question as to what type of education is most appropriate for women. Some writers and educators advocate basically the same type of education for women and men. Others contend that women's educational needs are entirely different from men's and that they need a separate curriculum. This question has been explored in considerable depth by Mueller (36) and Komarovsky (25), and more recently in Education of Women--Signs for the Future (12). Although this question is yet to be resolved, it is felt that the interdisciplinary approach used in the latter publication represents one of

the more fruitful approaches.

Need for a Vocational Theory for Women

Although it was long recognized that women are different from men in several important respects (physically, emotionally and psychologically), the effect of these differences on their vocational pursuits was not given serious consideration in earlier research. The realization that current theory of vocational development, which was derived primarily from data collected on men, is not equally applicable to women, has led some of the leading vocational theorists, such as Super and Tiedeman, to the conclusion that a separate theory of vocational development is needed for women.

In Psychology of Career's Super states that "women's careers, career orientations and career motivations differ from those of men and are likely to continue to differ in important respects." (50:76) More recently Tiedeman has offered propositions for a theory of women's vocational development explaining that "for one reason and another, the educational and position (occupational) choices of males and females differ." (55:37)

Background and Rationale

Viewing vocational development of women from a broad sociological perspective, it is evident that tradition plays a significant part. Her sex role is not only biologically determined by her child-bearing capacity, which gives homemaking a central place in her career, but it is also determined by deeply ingrained cultural patterns. As Sutherland observes:

> "During the early years there is equal education along with boys. For girls more than boys this is interrupted by marriage and early child-rearing. As woman's education progresses, her choice of specialized fields is more restricted than for young men. The heavy hand of tradition has not been entirely lifted in this respect, though women are entering more fields of interest than ever before." (12:16)

Considering the large number of women in the labor force, the actual number of occupations open to women appears to be fairly circumscribed with the majority entering a relatively small number of traditionally feminine occupational fields, such as clerical, secretarial, nursing, teaching and sales. Often these serve as "stop-gap" occupations until the girl marries, or, if married, until she has a family. Most of the remaining women seem to engage in occupations in which there are fairly large numbers of both men and women. A very small number enter the domain of men and engage in what are usually considered to be men's occupations, such as physician, lawyer, scientist.

Viewing women's vocational development from this perspective, women's occupations might be characterized as falling along a continuum which can be defined as "traditional" at one end and "non-traditional" at the other. Because of the biologically and socially determined sex role differences between men and women, the concept of a traditional--non-traditional continuum has less meaning for men but seems to be quite meaningful in attempting to understand the vocational development of women. Hence it represents a major point of departure in the present investigation.

A study by Komarovsky in 1946 lends support to the appropriateness of such an approach. She collected autobiographical and interview material from 153 women seniors in an attempt to study the nature of

their roles in college. She concluded from her data that college women are exposed to two contradictory roles, which she characterized as the "feminine" and the "modern" roles. In her description of the former she states:

> "While there are a number of permissive variants of the feminine role for women of college age ('the good sport,' 'the glamour girl,' 'the young lady,' 'the domestic home girl'), they have a common core of attributes defining the proper attitudes to men, family, work, love, etc., and a set of personality traits often described with reference to the male sex role as 'not as dominant or aggressive as men' or 'more emotional, sympathetic.'" The modern role, on the other hand, "partly obliterates the differentiation in sex. It demands of the woman much the same virtues, patterns of behavior, and attitudes that it does of men the corresponding age." (24:187)

The author further states that during college years the conflict between the feminine and modern roles centers about academic work, social life, vocational plans, excellence in specific fields of endeavor, and a number of personality traits. She further characterizes them in their ideal form as homemaker (feminine) and career girl (modern).

She notes that the college women in her study reported that they frequently "played dumb" and pretended inferiority in the presence of male companions. To play the modern role in such instances would be to jeopardize their social standing.

In contrast to the girl attempting to fill the modern role, the "feminine" girl can thus be portrayed as less achievement oriented, more deferent towards men, less aggressive and less dominant. In subordinating her wishes to those of the opposite sex and in settling for less than equality, she would appear also to have a lower degree of autonomy.

Komarovsky's dual classification of college women's roles is in some respects similar to the classification of women's career patterns

presented by Super in Psychology of Careers (50:77-78). His "stable homemaking" and "conventional" career patterns are followed by the woman who sees her primary role as housewife and mother. His "double track" and "stable working" career pattern, on the other hand, have in common the fact that the women following these patterns do not relinquish their career plans and ambitions, even though they may become homemakers in addition to pursuing a career.

Within the conceptual framework of the continuum described previously, along which women's occupational preferences fall, one would logically classify as "traditional" the homemaker, the "feminine" girl, the woman following the "stable homemaking" and "conventional" career patterns. Conversely, one would more often expect to find the "modern" or "career" girl, the "stable working" and "double track" career pattern woman at the "non-traditional" end.

If one accepts the assumption that women's occupational choices do fall along such a continuum, the question arises as to how one can classify them in accordance with the concept. A scale containing a variety of occupations was developed for this purpose. The judgments of experienced college counselors, plus U. S. Census figures relating to numbers of men and women in the labor force, were used as criteria for placing occupations into appropriate categories.

Since the major purpose of this study was to relate occupational preference to personality variables, a problem arose in deciding what personality variables were to be considered and how these would be measured. In an attempt to make these decisions the following question was first posed: What would be the distinguishing characteristics of a person whose occupational preferences and subsequent career pattern

are what we would term "non-traditional"? This would probably be a person who is flexible in her thinking, a person who has a high degree of tolerance for ambiguity, since there are fewer guidelines for the role she has chosen--a person who very likely is more oriented to values than to facts. In many respects a woman thus described would be rejecting the conventional mold, the stereotyped role prescribed by custom for females. This suggests that a fruitful instrument for differentiating between traditional and non-traditional occupational preferences and career patterns of women might be a measure of the degree to which they are stereotyped in their thinking. In fact, the description of the non-traditional woman given above very closely approximates Stern's (48) theoretical model of a person who does not readily accept stereotyped statements of belief.

Combining the descriptive material discussed previously, we find ourselves with two fairly distinct models of the types of women to be found at each end of the continuum. The "traditional" woman would seem to be a preserver of the status quo in terms of women's "usual" or "given" role, relatively inflexible in her thinking, with a low tolerance for ambiguity in terms of role, and committed primarily to being a homemaker. If there were career ambitions they would be limited to work of a "stop-gap" nature (before marriage, before the first child, between the birth of one child and another) and to work that is confined almost exclusively to women, such as teaching, nursing, home economics, secretarial work, retail sales. She is likely to be more deferent, less achievement oriented, less aggressive, less dominant and less autonomous than her non-traditional counterpart.

The "non-traditional" model would be characterized somewhat differently. In the first place, she would seem to be a person who is aware

of the ambiguities, the inconsistencies and change associated with the role of women in the society and who is able to tolerate this ambiguity and adjust her actions accordingly. She may be interested in homemaking, but in any case she would have strong and continuing career ambitions which she carries out. Her work is apt to be in a field where women are not in strong majority. It is likely she will be perceived as less deferent, and more aggressive, more autonomous, and more dominant than her traditional counterpart, partly because she expects, and asserts equality with males in many respects.

According to Super, vocational development is one facet of an individual's personal development. He also asserts that both types of development are integral parts of an ongoing process which he characterizes as "the implementation of a self-concept." (50:185,191) The term "self concept" as it is used here refers to the individual's picture of himself both at a given time and over the entire span of his life. The picture is subject to modification, especially during the early formative years of development, and this modification is determined not only by the individual's immediate picture of himself, but also by such things as his conception of what he would like to be, by what he thinks he ought to be, and by his perception of how others see him.

Super's formulation suggests to the writer that a study of pertinent aspects of personal development should throw light upon subsequent vocational development. It suggests that knowledge of a person's attitudes, beliefs, values and needs, plus information concerning his personal and social development, should provide important clues as to subsequent vocational development. It further suggests that there are relationships between vocational and personal development and that these relationships

should be ascertainable through the use of appropriate research technique.

In the present study it is assumed that a person's belief system and his need patterns are of such significance in his personal development that they represent important determinants of his later occupational choice. Because of the myriad of factors that impinge upon and influence personal development, it is realized that it will be impossible in such a study to control or account for independent variables with which the study is not directly concerned.

Hypotheses

The major hypotheses with which the study will be concerned are stated below. In Chapter III these operational hypotheses will be converted into testable hypotheses and stated in the form of null and alternate hypotheses.

Hypothesis 1: Female students in traditional curricular areas will be significantly more traditional in their occupational preferences than female students in less traditional curricular areas.

Hypothesis 2: Female students in combined traditional curricular groups will be significantly more traditional in their occupational preferences than female students in combined non-traditional curricular groups.

Hypothesis 3: Female students in traditional curricular areas will be significantly more stereotyped in their beliefs than female students in less traditional curricular areas.

Hypothesis 4: Female students in combined traditional curricular groups will be significantly more stereotyped in their beliefs than female students in combined non-traditional groups.

Hypothesis 5: In separate curricular groups there will be a tendency for female students who are most traditional in their occupational preferences to be most stereotyped in their beliefs; conversely, those who are least traditional in occupational preferences will tend to be least stereotyped.

Hypothesis 6: In all curricular groups combined there will be a tendency for female students who are most traditional in their occupational preferences to be most stereotyped in their beliefs; conversely, those who are least traditional in occupational preferences will tend to be least stereotyped.

Hypothesis 7: Female students in traditional curricular areas will demonstrate a high manifest need for abasement, deference and nurturance and a low manifest need for achievement, autonomy, dominance, aggression and endurance; conversely, female students in less traditional curricular areas will tend to demonstrate a high manifest need for achievement, autonomy, dominance, aggression and endurance, and a low manifest need for abasement, deference and nurturance.

Definition of Terms

1. Stereotypic Thinking--the degree to which a person is stereotyped in his thinking as measured by his score on the Inventory of Beliefs. A high score represents a low degree of acceptance of stereotyped statements and a low score--a high degree of acceptance of stereotyped statements.

2. Occupational Preference--represents the degree to which an individual indicates a preference for occupations that are classified traditional as opposed to those classified as non-traditional on a scale specially designed for this purpose (called the Occupational Preference Sheet).

3. Manifest Needs--refers to the fifteen manifest needs measured in the Edwards Personal Preference Schedule, a standardized measure of certain personality variables.

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4. Traditional--the tendency for a woman to readily accept and conform to what is considered to be the conventional or typical female role in our culture.

5. Non-traditional--the tendency for a woman to reject and not to conform to what is considered to be the conventional or typical female role in our culture.

Summary

This chapter begins with a statement of the problem, which is to investigate differences in stereotypic thinking, psychological needs and occupational preference among undergraduate women in selected curricular areas. The purpose and importance of the study are discussed, followed by background information and a discussion of the rationale behind the study. A major feature of the latter is development of the theoretical concept of a "traditional--non-traditional" continuum along which women's occupations might fall. Theoretical models are developed to illustrate this concept and an attempt is made to relate these to the more generalized concept of stereotypy and to certain personality variables. It is pointed out that vocational development is considered to be one aspect of the larger phenomena of personal development and that it is therefore logical to expect certain relationships between selected facets of both vocational and personal development. Major hypotheses are stated and terms used in the study are defined.

Chapter II will contain a review of research and literature in areas pertinent to the study--women's roles, vocational theory, psychological needs and stereotypy. In Chapter III design and methodology will be discussed, including a description of the instruments used in the

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study, report of a pilot study, sampling procedure, statement of hypotheses, and statistical procedures. An analysis of the data and discussion of results will be conducted in Chapter IV. Chapter V will contain a summary of results, conclusions and implications.

CHAPTER II

REVIEW OF THE LITERATURE

Introduction

The purpose of the review of the literature is fivefold. First, it is an attempt to orient the reader to the major trends in vocational theory and, in particular, to those theoretical formulations which form the basis for the conceptual framework of the present study. Secondly, it represents an attempt to cover research that seems to be of most significance in the formulation of a vocational theory for women. Thirdly, this review represents an attempt to focus upon, and bring into proper perspective, sociological and psychological aspects of women's personal development which have impact upon their vocational pursuits. Accordingly, the question of acquired versus inherent differences between the sexes is explored, along with the problems arising from the changing roles of women in our society. Fourthly, an attempt is made to cover the research which has concerned itself with the relationship between psychological needs and some aspect of vocational theory or vocational development. Finally, a section of this chapter is devoted to research which demonstrates the utility of the Inventory of Beliefs as a measure of stereotypic thinking and which further demonstrates the way in which stereotyped thinking may be related to certain aspects of personal and vocational development.

Vocational Theory--General

For many years the standard approach to problems of a vocational nature has been an application of the psychology of individual differences. As Super states, "Concurrent practices (in vocational psychology) are based primarily on the assumption that differing abilities and interests are significant in determining occupational choice and success." (52:4)

The Strong Vocational Interest Blank illustrates application of the psychology of individual differences to vocations. Strong demonstrated that men successfully engaged in an occupation could be differentiated from men in general on the basis of measured differences in interests. Similarly, he found that men in one occupation could be differentiated from those in other occupations. Using Strong's instrument, meaningful comparisons can be made between an individual's measured interests and the interests of those successfully engaged in various occupations.

The Army Alpha Intelligence Test used in World War I effectively demonstrated that various occupational groups can be differentiated on the basis of intelligence, and thus illustrates another application of the psychology of individual differences. Subsequently, attempts were made to relate other psychological characteristics, such as personality traits, to vocational life. Hence the current emphasis in vocational counseling upon obtaining a variety of information about the individual, typically through administering a battery of tests, in an attempt to relate the information to known job characteristics and requirements.

Although the application of psychology of individual differences has been extremely useful, it was felt by some vocational theorists that other potentially fruitful approaches were being neglected. Super, for

example, proposed that, in addition to trait theory, attention should be given to trends in development, particularly during the adolescent period. More specifically, he proposed use of a life history method which in many ways is parallel in meaning to the "life stages" concept introduced earlier by Buehler (4). Buehler's five life stages, named in such a way as to describe the problems most characteristic of each stage, were designated growth, exploration, establishment, maintenance and decline. Super believes it is possible to describe the vocational behavior that may be expected at each life stage. In describing the life history approach he states:

> "The assumption underlying this approach is that one way to understand what an individual will do in the future is to study what he has done in the past . . . in order to ascertain the recurring themes and underlying trends." (49:13)

Super employs the term "vocational development" to describe the progression of an individual through the various stages of his occupational life. He sees vocational development as one aspect of individual development, as are social, emotional and intellectual development. He sees work as one medium through which the total personality can manifest itself. It is in this context that he sees vocational development as being the implementation of an individual's self concept. For, as he points out, "choice of an occupation is one of the points in life at which an individual is called upon to state rather explicitly his concept of himself, to say definitely 'I am this or that kind of person.'" (50:191)

In formulating his theory of vocational development Super draws heavily upon the work of Ginzberg and associates (17), which is one of

the early successful attempts to apply principles of developmental psychology to questions in the vocational realm. On the basis of a cross-sectional study of male adolescents at different age levels, Ginzberg proposed that occupational choice is a process which begins at a fairly early age (about age 6) and continues well into early adult life. He stressed the irreversibility of the occupational choice and suggested that compromise is an essential part of the process. Ginzberg identified three main periods in the process and designated them as phantasy (age 6 - 11), tentative (age 12 - 17) and realistic (age 18 and beyond). Subsequent research by others suggests that the process begins even earlier than age six and that crystallization of occupational choice may take place at a very late stage of development for some individuals.

Miller and Form (35) reported a study which has important implications for vocational theory. They analyzed work histories of a representative group of men in order to study existing patterns. Using what amounted to a life stages approach, they classified work periods into preparatory, initial, trial, stable and retired. Their work suggests that a variety of "career patterns" exist. Super (50) has designated these as the stable, conventional, unstable and multiple trial career patterns.

That Tiedeman has for many years been interested in developing a vocational theory is evident from the Harvard Studies in Career Development. In a recent paper (55) he outlined what he considers to be the major elements of a vocational theory. It is interesting to note that the meaning he attaches to the term "career development" differs considerably from Super's concept of "vocational development." Tiedeman proposes that the central focus of research in career development must

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be on the perceptions a person has of himself in relation to work. This approach may also be contrasted with Bordin's proposition (3) that measured interests are primarily a reflection of the degree of an individual's acceptance or rejection of an occupational stereotype as self-descriptive, and that interests vary with the knowledge an individual has of the "true occupational stereotype." Tiedeman's main purpose in studying career development is to predict a person's occupations and their sequence. He points out that most of the studies of vocational choice have consisted of reconstruction of the career process by an outside person. It is his contention that a better predictive system can be developed through the use of a person's reconstruction of his own career process. Thus, he contends that "the kind, duration and sequence of educational and vocational choices can be predicted with greater fidelity if a person's perceptions of himself in relation to work are taken as the organizing thema directing career decisions or their absence." He goes on to explain that: "Perception of self and work thereby become intervening variables necessarily intervening between circumstances and decision in a particular situation of educational or vocational choice." (55)

The major problem, as Tiedeman sees it, is that of "specifying relevant data and interactions of data and the implications of each pattern for position choice." (55:27) Position, the term he favors in place of job or occupation, is defined as "a patterned set of activities practiced in a specified context . . ." (55:27) The "system of data" which he considers most important for predicting position choice are (1) circumstances of child rearing, (2) stated preferences while in school, (3) need patterns as these can be inferred from projective tests,

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and (4) the individual's career pattern as it exists at the time of prediction. Aptitude, physical and mental capacity, age and sex are considered to be of less importance for use in prediction.

In Psychology of Occupations Roe conceives of occupations as a primary source of need satisfaction. She states: "In our society there is no single situation which is potentially so capable of giving satisfaction at all levels of basic needs as is the occupation." (42:31) She subscribes to Maslow's (29) theoretical orientation which conceives of individual behavior as largely determined by fundamental goals or needs. Roe maintains that Maslow's arrangement of needs in a hierarchy of prepotency has particular relevance for the psychology of occupations. She incorporates this aspect of need theory and further elaborates upon the relationship of needs to occupation in her development of a two-way classification of occupations into "group" and "level" (42). The arrangement of occupations into a dual classification is mainly for the purpose of making it possible to see more clearly the relationship of various aspects of personality and background to occupational choice. The major divisions in her classification system are presented below.

Groups		Levels	
I.	Service	1.	Professional and Managerial 1
II.	Business Contact	2.	Professional and Managerial 2
III.	Organization	3.	Semi-professional and Small Business
IV.	Technology	4.	Skilled
V.	Outdoors	5.	Semi-skilled
VI.	Science	6.	Unskilled
VII.	General Cultural		
VIII.	Arts and Entertainment		

In summary, Roe finds that such factors as intelligence, education and socio-economic background seem more closely related to "level" of occupation, while such factors as interest, attitude and personality

characteristics seem to be more closely related to "group."

In an earlier paper, Roe (41) suggests that an individual's ultimate vocational selection is determined in large part by circumstances in his early life. In particular, she suggests that child rearing practices and home climate shape the attitudes, abilities, interests and personality characteristics of the individual in such a way as to determine the type of occupation he will enter at a much later period. She presents a hypothetical model for use in predicting whether an individual will have a primary orientation toward "persons" or "not persons" and for predicting the "group" in which his occupational selection will fall. For example, an individual from a cold, rejecting family atmosphere would be expected to be oriented toward an occupation requiring little personal interaction or contact with others, and would choose a scientific field of work.

Grigg (18) designed a study to test Roe's hypothesis that individual's in science and mathematics would report colder, less attentive treatment by parents, whereas those in nursing, a <u>service</u> occupation, would report warmer, more child-centered treatment, by their parents. He found no significant differences and had to reject the hypothesis. There is a question as to whether or not his groups were really contrasted. Roe (42) indicates that nurses may be more like those in scientific occupations than those in service occupations.

Using psychoanalytic theory, Nachmann (38) effectively demonstrated the relationship between childhood experience and vocational choice. She formulated hypotheses regarding the early childhood experiences which psychoanalytic theory would require to account for the adult job behavior of lawyers, dentists and social workers. Her findings support her major assumptions that different occupations afford differing opportunities

for expression of impulses and utilization of defenses, and that occupational groups vary significantly from one another in important personality characteristics.

In a somewhat similar vein, Segal (44) had previously used psychoanalytic theory to demonstrate the role of personality in the occupational choice of creative writers and accountants. He found, as anticipated, that creative writers showed greater tolerance for ambiguity, more evidence of expression of hostility, and less attempt at emotional control than did accountants. His findings in general tend to validate the commonly held idea that personality factors are an important determinant of vocational choice and that personality theory can lead to more complete understanding of the role of such factors.

Under the assumption that career is but one aspect of personality, O'Hara (39) translated Roger's personality theory into propositions that are relevant for career development. O'Hara focused upon self concept as a central factor in an individual's vocational development, which, he believes, follows logically from the assumption that self concept is a central factor in personality development.

Studies of a sociological nature by Friend and Haggard (16) and by Hollingshead (21) have also demonstrated the relationship between vocational development and certain aspects of an individual's social background. For example, Friend and Haggard found revealing differences in family background between those individuals rated high in work adjustment and those rated low. Using a cross-sectional approach and case history method, Hollingshead found that youngsters from different social classes tended to aspire to different types and levels of jobs. It was apparent that, in the fairly static community studied, social status was

an important determinant of occupational choice and vocational opportunity.

Vocational Theory--Women

Very few researchers in the vocational realm have attempted to develop a theory designed specifically for application to women. Super (50), Tiedeman (55) and Matthews (30) are among the few who have delved into this problem. Super recognizes the need for a separate vocational theory for women and suggests ways in which the career patterns of men and women differ. In discussing this subject he states:

> "The sex roles of men and women are socially as well as biologically determined, as anthropological studies and the changing roles of women during the last century make clear. But, women's careers, career orientations and career motivations differ from those of men and are likely to continue to differ in important respects. An adequate discussion of these differences becomes especially important as larger numbers of women participate in the work force." (50:76)

Super (50:77-78) presents a system for classifying women's career patterns. The seven patterns outlined by him are summarized below. The first three patterns for women bear the same title as his career patterns for men (50:73-74), but the descriptions bear little resemblence to men's career patterns.

1. The stable homemaking career pattern. This category includes all women who marry without having had significant work experience.

2. The conventional career pattern. In this pattern are those women who, after a fairly brief work experience, marry and leave work to become full-time homemakers.

3. The stable working career pattern. This category includes those women who enter the work force and embark upon a career that becomes their life work.

4. The double track pattern. This pattern includes those women who, after completing their education, marry and continue with a double career of marriage and homemaking.

5. The interrupted career pattern. The sequence in this pattern is one of working until time of marriage, full-time homemaking and then resuming work when the children are old enough to be left.

6. The unstable career pattern. The pattern consists of the cycle: work, marriage, full-time homemaking, return to full-time work intermittently, followed each time by a return to homemaking.

7. The multiple trial career pattern. This pattern consists of a succession of unrelated jobs with stability in none. It is the same as a similarly-named pattern for men.

Matthews (30) presents some "elements" that she considers to be necessary aspects of a theory of career development for women. She has launched an investigation aimed at testing some of these propositions, particularly one to the effect that young women, during the period from ages fourteen through twenty, show a magnetic pull toward the acceptance of the marriage goal as they undergo a shift in balance from career-directed to marriage-directed goals.

In the attempt at formulation of a theory of women's career development, Tiedeman, O'Hara and Matthews (55:37-41) present seven propositions which they consider necessary for such a formulation. The authors hasten to point out that these propositions represent an interpretation of things as they are but not necessarily as they need to be. These

propositions, which in skeleton form are quoted below, clearly reveal the influence of culture.

> "Proposition 1. Men and women differ biologically and these biological differences give rise to differentiated qualifications for employment.
>
> Proposition 2. Women are taught to be women; men are taught to be men.
>
> Proposition 3. Women are expected to live with their parents as long as necessary, but in this case, must provide their clothes and satisfy their special wants by themselves provided the family income is modest or less.
>
> Proposition 4. Women are expected to marry.
>
> Proposition 5. Education is frequently considered of questionable value to a woman; education is the road to professional employment for men.
>
> Proposition 6. The husband is the 'breadwinner'; the wife is the 'homemaker.'
>
> Proposition 7. There are men's jobs and women's jobs."

Caplow (6) presents facts about women's occupations that have implications for vocational theory. For example, he states: "Occupational inequality (of women) is guaranteed by customs and folkways which differentiate the careers of women from those of men." (6:234) He describes some of the special conditions of female employment which he believes contribute to differences in their careers. Some of these are as follows:

1. Careers of women are usually not as continuous as men's.
2. Employed women are frequently only secondary breadwinners.
3. A woman's residence is primarily determined by her husband's occupation.
4. There is always a pool of women available to take over a

woman's position since a considerable proportion of them are out of the labor force at a given time.

5. Women are often subject to "a vast network of special statutes, rules and regulations--some designed for their protection, some intended to reduce their effectiveness as competitors, and some adroitly contrived for both purposes at once." (6:236)

The impact of cultural forces upon women's work roles is brought out by Caplow in his statement that: "Women are barred from four out of five occupational functions, not because of incapacity or technical unsuitability, but because the attitudes which govern interpersonal relationships in our culture sanction only a few working relationships between men and women and prohibit all others on grounds that have nothing to do with technology." (6:237)

Sex Differences and Women's Roles

The subject of women's role in society and the question of sex differences has long been under study, particularly by anthropologists, sociologists, psychologists and educators. In addition, these matters have been given wide coverage in publications designed for popular consumption. Unfortunately, much of the writing on these subjects has been uniformly lacking in objectivity and scientific rigor and little or no attempt has been made to identify subjective values and individual biases, nor to differentiate between what <u>is</u> and what <u>ought</u> to be. There is additional confusion in this realm due to the discrepancies that have been found to exist between popular belief and objective fact. For example, the popular conception of women as the "weaker sex" and as "inferior in intellectual ability" has been little affected by evidence

to the contrary. In this section an attempt will be made to present some of the more objective findings concerning sex differences and women's roles.

In one of the more comprehensive reviews of research and findings on the subject of individual differences, Anastasi in Differential Psychology draws the following conclusion concerning sex differences:

> "From all that has been said, it is apparent that we cannot speak of inferiority and superiority, but only of specific differences in aptitudes or personality between the sexes. These differences are largely the result of cultural and other experiential factors, although certain physical sex differences undoubtedly influence behavior development, either directly or through their social effects. Lastly, the overlapping in all psychological characteristics is such that we need to consider men and women as individuals, rather than in terms of group stereotypes." (1:497)

Mead (32) gives a vivid illustration of the role of cultural factors in sex differences in her description of a primitive tribe in which there appeared to be a complete reversal of sex roles and sex attitudes, in comparison with the roles and attitudes found in our own society. In the Tchambuli tribe the women held the power and carried out the major activities of fishing and manufacturing mosquito netting, while the men engaged primarily in artistic and non-utilitarian activities such as dancing, painting and carving.

More recently, in Male and Female (31), Mead points out the large degree of overlapping in contemporary American society of those traits typically classified as "masculine" and "feminine." She cautions about the dangers inherent in an overemphasis on maintaining these differences by the thoughtless application of social sanctions for even slight deviations on the part of individuals. She contends that in a complex and changing society such overlapping is not only inevitable,

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but desirable, in view of the wide variation in temperament in each sex.

Using a psychoanalytic interpretation, Deutsch (13) introduces the concept of basic femininity which she calls the "feminine core." In discussing the relationship between intellectual productivity and femininity she concludes that "only exceptionally talented girls can carry a surplus of intellect without injuring their affective lives." She further states that, in women, "intellectuality is, to a large extent paid for by the loss of valuable feminine qualities." (15:290) However, there have been many questions raised concerning her concept of the "feminine core" and considerable disagreement with Deutsch's dscription of ideal femininity as a "harmonious balance of passivity, masochism and narcissism." Tiedeman, in discussing the apparent inhibiting effect of intellectualization upon feminine fulfillment questions whether this condition needs to prevail. He offers the alternative possibility that "damage to feminine core development may result from the injury to the woman's self concept that results from society's views of intellectual activity in women, rather than from the process of intellectualization itself." (55:42)

In an investigation of the relationship of interests to abilities and reputation among first grade children, Tyler (56) found that even at this early age and level of development there are noticeable differences in interests between boys and girls. This finding would seem to indicate that sex role patterns are already established in first grade. In summarizing her findings, Tyler states:

> "The most striking finding is the sex difference itself . . . To the author this would suggest a role theory of interest patterning. Since the differences between the sexes is one of the earliest to become apparent to children, one might expect that their attitudes about what things are

> appropriate for them to do might be related to these differences before other role factors such as class concepts and occupational stereotypes begin to influence interests." (5:263)

The cultural contradictions and psychological problems of women resulting from the roles they are expected or required to play was explored by Komarovsky (24) and Jahoda (23). Komarovsky concluded that college women are confronted by a number of incompatible sex roles imposed upon them by society. She contends that college women are faced with two mutually exclusive roles which, in terms of personality traits evoked, are diametrically opposed. She designates them as the "feminine" and "modern" role respectively. As indicated in Chapter I, these role descriptions were used in development of the concept of a "traditional--non-traditional" categorization of women's occupational preferences. In discussing the implications of these contradictory roles, Komarovsky concludes that the best adjusted girl in contemporary society is the one who is:

> "intelligent enough to do well in school but not so brilliant as to get all A's; informal and alert but not consumed with intellectual passion; capable but not talented in areas relatively new to women; able to stand on her own two feet and earn a living but not so good a living as to compete with men; capable of doing some job well (in case she doesn't marry or otherwise has to work) but not so identified with a profession as to need it for her own happiness." (24:189)

In a replication of Komarovsky's study with a different college population, Wallin (59) reached much the same conclusion as Komarovsky concerning the contradictory nature of the roles imposed upon college women. He disagrees with Komarovsky, however, in respect to the seriousness of the situation, concluding that college women, in reality, seem to have little difficulty in resolving the conflict so engendered

by these contradictory roles.

In an exploratory study, Jahoda (23) interviewed several young professional women in an attempt to determine the way in which they solved problems of the competing attractions of different social roles and life patterns. She found that the degree to which the women were satisfied with or frustrated by their current role "seemed to color decisively accounts of the past." She concluded that the preferred approach to problems associated with role conflicts is by emphasis upon attitudes toward and feeling about one's role, rather than concern with defining, describing or outlining the role itself in any point in time.

Penetrating analyses of the educational needs of women have been presented by Mueller (36), Komarovsky (25) and, more recently, in a book edited by David (12). These are considered to be of particular relevance to the present investigation because of their emphasis upon the nature and complexity of women's role in contemporary society and because of their recognition of differences between the educational needs of men and women due to differences in the roles they are called upon to fill. For example, in Educating Women for a Changing World, Mueller states that problems peculiar to women's education arise primarily out of differences between the sexes. She claims that observed sex differences in many areas of life--attainment of eminence, child rearing responsibility, dress, values and interest--are culturally dictated and not inherently "true" differences. She predicts:

> "In the society of the future women will probably function more and more 'like men' as earners and citizens and less and less 'like women' in their homemaking and cultural activities . . . This role will be no more exacting for her than the earlier one, but obviously it will call for different kinds of skill, less patience and more aggressiveness, no less wisdom, but much more economic and scientific information than she has previously needed." (36:21-22)

In summarizing her own and related research on women's interests, Mueller concludes that 90% of high school seniors have a dominating interest which she designates as "interest in male association." The result of this is a narrowing of women's interests to the extent that "nine times out of ten she can see no further than her marriage." (36:35) Mueller's recommendation for women's education is a liberal arts curriculum, "general education at its best," to provide a vital ingredient--versatility.

Using a sociological approach, Komarovsky traces the life cycle of the middle class, college trained woman from adolescence to middle age "in order to lay bare the inconsistent social expectations and other social forces that cause conflict at every stage of her life." (24:1) She attempts to formulate a course for women's education and for women's lives that avoids the extremes of "feminism" (striving for equality with and treatment like men), on the one hand, and "anti-feminism" (belief that women's place is strictly in the home) on the other. She suggests that the stereotypes of "masculine" and "feminine," as applied to jobs, interests, and the like, is unfortunate and in many respects meaningless because of the changes in men's and women's roles and the resulting overlap between them. She further suggests that society itself needs to widen the range of sanctioned patterns of life for women as well as for men so that a great variety of personalities and circumstances may be accommodated.

The Education of Women--Signs for the Future is essentially a report of a conference sponsored by the American Council on Education in 1957. It contains a series of papers presented at the conference by leading figures in the social sciences, particularly those who have

written and conducted research in connection with women's education and woman's contemporary role. One of the major purposes of the conference was to review some of the current prejudices associated with the education of women and to determine "what might be done through experimentation and research to eliminate waste in women's education, first in respect to waste in fulfillment of the potential of the individual woman and, second, in respect to waste to a society more sorely pressed than we realize." (12:135) In discussing the scope of the problem, Donlon points out some of the subtle, and some not so subtle, prejudices against women entering higher education and against their entering certain fields of work, such as college teaching. The following excerpt seems to summarize her position very well.

> "It is important to wipe out, in education, the fiction that women lead sheltered lives . . . our cultural pattern for girls continues to prepare them for a life they do not have. Actually, of course, modern women have a more complex and difficult life than do modern men. We all suffer when girls are routinely shunted off into so-called easy courses, away from disciplines that will flex and strengthen their mental muscles." (12:11)

The following "basic facts," presented to the conference by Sutherland, offer clear-cut evidence of the scope of the problem and of the need for attention to the education of women (12:14-16).

1. By 1960 women are expected to outnumber men by two million.

2. Approximately half of the brightest 40% of high school graduates go on to college; of the half who do not attend, two-thirds are women. Of those who go on, only 37% of the women graduate in contrast to 55% of the men.

3. It is predicted that within the next few years half of all

married women by the age of 32 will have their youngest child in first grade and will have a life expectancy of at least forty more years.

4. One third of all adult women are employed regularly outside the home and another sixth are employed intermittently.

The results of a conference concerned with the problem of women in the "middle years" are contained in a book edited by Gross (19). At this conference Havighurst remarked upon the diversity in women's roles in the twentieth century and then noted: "At times they (women) appear to wish for the olden days when women's roles were restricted, but they had a safe, sure place in a man's world." (19:8)

In a recent paper Useem suggests that part of the problem in educating women is their own indifference toward the issues and their reluctance to face them squarely. She asserts: "Never has American society in terms of its own survival been so greatly in need of using its intellectual and social womanpower and never have women less internalized these societal needs as personal goals and aspirations." (57:1)

Psychological Needs and Vocational Development

The importance of Maslow's need theory in Roe's development of a vocational theory and, in particular, in formulating her "group" and "level" concepts, has already been discussed. This section will review additional attempts to utilize psychological needs or need theory in the investigation of some aspect of vocational life.

Walsh (60) investigated the relationship between manifest needs, as measured by the Edwards Personal Preference Schedule, and the liking or disliking of actual job duties. A Job Description Questionnaire containing job descriptions which had been previously judged by clinical

psychologists as satisfying specific psychological needs was completed by a group of male college students. Scores on the questionnaire were then correlated with scores on the Personal Preference Schedule. The major hypothesis was that individuals would select, as liked or disliked, the specific duties of any given job which are consistent with their psychological needs. It was found that subjects with certain manifest needs tended to select or reject job duties in a manner that judges had previously agreed would be consistent with these needs. The findings support the proposition that occupations serve as a major outlet for the satisfaction of psychological needs.

In an investigation of the relationship between motivational phenomena and occupational stratification Centers (8) concluded that his findings support Maslow's basic need theory. To get at generalized goals and values, he used statements reflecting the following values: leadership, interesting experience, esteem, power, security, self-expression, profit, fame, social service and independence. He made the assumption that value preferences indicated in response to these statements reflected important differences in needs. Two findings which he believes support Maslow's formulation of a hierarchy of prepotency in basic needs are: (1) the increasing frequency with which individuals at the lower occupational levels expressed a desire for security (which is low in Maslow's hierarchy); and (2) the tendency for individuals at the highest occupational levels to show a desire for self-expression (which corresponds to the highest need in Maslow's hierarchy--self-actualization).

In an attempt to relate career choice and need theory, Merwin and *Di Vesta* (34) studied differences in need strength and need satisfaction between two groups of undergraduates, one of which has indicated a

preference for teaching and a second which had indicated a preference for "other occupations." Merwin and Di Vesta used the theoretical proposition that "the degree of acceptance (or rejection) of a career is dependent upon the individual's perceptions that the career facilitates (or hinders) the satisfaction of his important needs." Four needs believed related to teaching were used--achievement, dominance, exhibition and affiliation. They used Stern's Activities Index to measure these needs and found that those in the teaching group registered a significantly stronger need for affiliation, while those in the non-teaching group showed a significantly higher need for dominance. The non-teaching group also showed a higher need for achievement and exhibition but this difference was not statistically significant. All of these findings had been predicted from the theoretical position being examined. They also found that attitude toward a particular field, in this case teaching, can be altered by manipulating cognitive structure.

Under the assumption that people seek satisfaction of their basic needs in every aspect of their lives, including vocational, Small (47) tested the proposition that a healthy ego of an adjusted boy will permit the individual to check his drive for need satisfaction against the reality of a situation. He found that the occupational choices of adjusted boys were more realistic than choices of less adjusted boys. In addition, even the fantasy choices of adjusted boys were tempered by reality to a greater extent than the fantasy choices of less adjusted boys. Small's findings fail to support Ginzberg's proposition that there is a developmental progression toward greater realism with increasing age. Small concluded that reality and fantasy factors operate simultaneously at all ages in selection of a vocational goal.

Schaffer (43) conducted a study in which he attempted to relate job satisfaction to need satisfaction. He theorized that: "Overall job satisfaction will vary directly with the extent to which those needs which can be satisfied in a job are actually satisfied; the stronger the need, the more closely will job satisfaction depend on its fulfillment." Contrary to expectations, he found little relationship between need strength and job satisfaction. On the other hand, there was a significant positive correlation between overall job satisfaction and mean satisfaction of the two highest needs of his subjects. The study is open to criticism in several respects, however. The questionnaire used to measure twelve different needs is of questionable validity, and there is some doubt as to whether his sample of seventy-two workers is representative of workers in general.

Siegelman (46) studied three vocational groups--chemists, ministers and military officers--to determine whether or not they manifested distinguishable basic need patterns. He constructed a personality model for each group on the basis of their job-role requirements. The instruments used to test these models were an Activities Index, sentence completion, personal interview and a biographical data form. One of his findings was that chemists showed a low need for affiliation and a high need for autonomy. The author concludes from his findings that "matching of occupations with personal need patterns is a major factor in vocational choice."

Inventory of Beliefs

The Inventory of Beliefs (9) was constructed originally for the purpose of measuring the extent to which the objectives of a college

general education program were being met in practice. It is based upon the assumption that there are measurable personality differences between individuals with, or amenable to, a good general education and individuals lacking or not amenable to such an education. In effect, the Inventory of Beliefs was designed for the additional purpose of differentiating between individuals in terms of psychological dimensions. Thus, in indicating agreement or disagreement with the 120 statements on the Inventory, an individual discloses the degree to which he is "stereotyped" in his thinking. The following excerpt from the manual should clarify this point:

> "The job description of the generally educated man or woman can be phrased psychologically in such terms as independent, understanding and adaptive. In contrast to this are persons whose responses are defensive, conforming, and resistant--in short, stereotyped at an immature level. From this viewpoint, we are defining areas of general education psychologically in terms of personality dynamics as well as by explicit reactions to the world of people, ideas and institutions. The instrument to be described here represents an attempt to explore relationships between such psychological dimensions and educational performances." (9:4)

The results of three studies of extreme scorers (9:12-13) on the Inventory of Beliefs shows that there are significant differences between low and high scoring students in choice of major, achievement, interests, vocational choice and attitudes. The generalizations which follow are based on these results. Matched groups of extreme scorers were used. The groups ranged in size from twenty-nine to sixty-one and were equated for intelligence. One of these studies was conducted by Stern and associates, who used experimental forms on the Inventory of Beliefs (S and T), and results of their study are reported in greater detail in Methods in Personality Assessment (48). Note that the higher a person's score

on the Inventory, the less stereotyped he is considered to be in his beliefs. Conversely, the lower his score, the more stereotyped he is considered to be.

1. Choice of major. High scorers tended to be majoring in the areas of humanities, social science and English in significantly greater numbers than low scorers.

2. Achievement. High scorers received significantly higher grades in comprehensive examinations in the social sciences and humanities, although differences in overall grade averages were negligible.

3. Interests. High scorers received significantly higher scores on the musical, artistic and social sciences scales of the Kuder Preference Record and lower scores on clerical and computational scales.

4. Vocational Choice. Vocational choices of high scorers indicated a preference for "occupations involving interpersonal, expressive, or abstract activity, such as psychology, music or theoretical physics." Low scorers showed a preference for "more impersonal, concrete or status oriented vocations such as engineering, medicine or law." (9:12)

5. Personality Characteristics. Results from Stern's Activities Index showed that "high scorers seem to prefer activities which reflect autonomous or independent behavior, abstract and analytical intellectual interests and aesthetic experiences. Low scorers reject such activities, their preferences reflecting orientation towards the achievement of financial status, security, compulsive orderliness, and submissive or dependent behavior." (9:13)

Care should be exercised in interpreting the above findings due to the fact that (1) the sex distribution of the samples is not given, (2) only extreme scorers were used, (3) the vocational choices expressed and choice of major must be considered tentative and subject to change, and (4) no information is available concerning subsequent success in college, in major field and in later occupational life.

In discussing situational and individual determinants of behavior in relationship to curriculum, Stern (48) indicates that the humanities and social sciences involve greater ambiguity and abstraction than the biological and physical sciences usually do. The generalization is then made that all subject matter may be viewed in terms of theoretical versus practical, value versus fact, symbolic and abstract versus concrete, and verbal versus quantitative. In reporting a study of stereotypy, Stern uses these terms in describing a stereotyped individual and his opposite.

The synthetic models of a "stereopath" and a "non-stereopath" reported by Stern and associates (48:Chapter 10) are of particular interest because of their bearing upon the present investigation. A stereopath is defined, in general terms, as an individual who tends to accept stereotyped statements of belief and who, consequently, receives a low score on the Inventory of Beliefs. A non-stereopath tends to reject stereotypic statements of belief and receives a high score on the Inventory of Beliefs. The term "synthetic" as used here signifies that the approach used was to develop hypothetical personality models requiring no direct or prior observation.

In the synthetic model the stereopath is described as an individual who (1) will encounter difficulty in tasks involving ambiguity, abstraction, spontonaeity, and departure from conventional standards, (2) will

most likely have difficulty in such areas of a general education program as social sciences and humanities where emphasis is placed upon abstract analysis and relativity of values and judgments rather than fixed standards, (3) is practical minded, (4) may be expected to view higher education primarily as vocational training, (5) places emphasis on practical activity, tangible recognition of achievement and depersonalization of relationships, (6) is more likely to be found among those preparing for law, medicine, business and engineering, than among those preparing for academic work or for the expressive arts. (48:191)

The non-stereopath is described as an individual (1) who cultivates highly personalized and individualized social relations, (2) who tends to reject authority figures, (3) whose behavior is characterized by non-conforming flexibility, (4) who has a spontaneous and acceptant impulse life, and (5) who places high value upon self-expression in the arts, interpersonal relationships, aesthetic experiences and interest in social affairs. (48:192)

While the results of a study of extreme scorers reported by Stern tend to confirm parts of the above models, the evidence is by no means conclusive. It is evident that a considerable amount of further investigation will be required to refine these models to the point where they can be applied to questions of a vocational and educational nature.

In a comprehensive study of critical thinking, values and attitudes, Lehmann and Ikenberry (27) analyzed the results of a battery of tests administered to an entire freshman class at Michigan State University. There were 2,776 usable tests, constituting 93% of entire class. In this study the Inventory of Beliefs was used to measure the attitude of stereotypy. Among the other instruments used were Rokeach's Dogmatism Scale, Prince's Differential Values Inventory, a Test of Critical Thinking,

Wesley's Rigidity Scale, and a Biographical Data Sheet. Information on intellectual ability, and achievement was also available from entrance tests.

It will be noted that the Differential Values Inventory used in the Lehmann and Ikenberry study is designed to measure the degree to which an individual is "traditional" as opposed to "emergent" in his values. An individual is described as having high traditional values if he tends to regard highly the values of individualism, puritan morality, emphasis on the future, and meaning of work and responsibility. On the other hand, an individual is described as having emergent values if he tends to regard highly such values as sociability, conformity, relativistic moral attitude, and emphasis on the present.

Some of the major findings of Lehmann and Ikenberry which are relevant to the present study are summarized below.

1. Significant sex differences were found on all the major variables studied, except for critical thinking. Males were more stereotyped, more dogmatic, more traditional in their values, higher in scholastic aptitude and more rigid than were females.

2. With intellectual ability controlled, significant differences were noted between females in different colleges in stereotypy, values, dogmatism and critical thinking. Those in the College of Science and Arts and College of Communication Arts were least stereotyped and least traditional in their values. Those in the Colleges of Veterinary Medicine, Home Economics and Education were most stereotyped and most traditional in their values.

3. A significant positive relationship was found between Inventory of Beliefs scores and grades in Communication Skills and Natural Science

i.e. those least stereotyped tended to receive highest grades.

4. A slight, but significant, positive relationship was found between Inventory of Beliefs scores and scores on the College Qualification Test, a measure of intellectual ability used in the study.

5. Significant differences in stereotypy were found among various socio-cultural groups. Students whose parents completed high school only and whose fathers were in the "laborer" class were more stereotypic. Students whose parents had completed college and whose fathers were in an executive or professional position were least stereotyped.

6. Students in technical and vocationally oriented major fields tended to be more stereotypic than students in a liberal arts program.

A finding pertinent to the present study is that of a significant relationship between stereotypy and college of enrollment of students in this study. This suggests there may be a significant relationship between the degree to which an individual is stereotyped in his thinking and his occupational preferences as well as choice of major. In addition, the finding that least stereotypic individuals tend to be least traditional in values, by Prince's definition of values, tends to lend support to the inference that least stereotyped females might also show a preference for less traditional women's occupations.

Summary

This chapter contains a review of publications considered most relevant to the study and covering the areas of general vocational theory, women's vocational theory, psychological needs as related to women's vocational development, and the attitude of stereotypy as measured by the Inventory of Beliefs. Women's roles and differences

between sexes are also discussed. In Chapter III design and methodology will be discussed, to be followed by an analysis of the data and discustion of the results in Chapter IV, and a summary of results, conclusions and implications in Chapter V.

CHAPTER III

DESIGN AND METHODOLOGY

This chapter contains a discussion of the instruments to be used in the study, population and sampling procedures, hypotheses to be tested, statistical procedures to be used in analysis of the data, and limitations of the study.

Instruments

Edwards Personal Preference Schedule

The Edwards Personal Preference Schedule was selected for measuring psychological needs of students participating in the study.

Description The Edwards Personal Preference Schedule was designed to measure fifteen manifest needs. It consists of 225 pairs of statements to which the individual responds by means of a forced-choice technique. Unlike some of the more clinically-oriented personality inventories, the Personal Preference Schedule purports to measure a number of "normal" personality variables. The variables have been drawn from a list of manifest needs presented by Murray and others (37).

The fifteen manifest needs measured by the Personal Preference Schedule are: achievement, deference, order, exhibition, autonomy, affiliation, intraception, succorance, dominance, abasement, nurturance, change, endurance, heterosexuality and aggression.

In his response to each pair of statements on the Personal Preference Schedule an individual chooses the one he considers most charac-

teristic of himself. A distinguishing feature of the Personal Preference Schedule is that the two statements comprising each item are matched in terms of social desirability. The purpose is to eliminate, insofar as possible, the possibility that an individual might choose a statement on the basis of its social desirability, rather than on the basis of its being more descriptive of him. Another feature of the Personal Preference Schedule is the inclusion of a consistency variable from which a consistency score is obtained for each individual.

Reliability Test-retest reliability coefficients and coefficients of internal consistency are reported for the fifteen personality variables in the Personal Preference Schedule. The internal consistency coefficients range from .60 to .87 with a median of .78. Test-retest reliability coefficients for the fifteen personality variables range from .74 to .88 with a median of .83 (14:16). These reliability estimates are considered to be adequate to warrant use of the instrument in the present study.

Validity One of the questions frequently raised in connection with the Personal Preference Schedule concerns its validity; that is, the extent to which it actually measures what it purports to measure. It is in this area that the Personal Preference Schedule appears to be most vulnerable, for there is a dearth of studies and little concrete evidence of validity of the instrument. In the test manual the author reports evidence of face validity in the form of agreement between self-ratings of groups of students and their scores on the fifteen variables. He also reports concurrent validity in the form of correlations between variables on the Personal Preference Schedule and variables on the

Guilford-Martin Personnel Inventory and the Taylor Manifest Anxiety Scale. The correlations are reported to be, "in general, in the expected directions." The information reported in the manual in respect to these correlations is not sufficient to explain what is meant by the interpretation that the correlations are in the "expected" directions. In any event, it must be noted that (1) face validity is tenuous evidence of validity, and (2) correlation technique is one of the less sensitive methods for handling parametric data and therefore yields information that is difficult to interpret in terms of the question: What is the instrument actually measuring?

Studies have been conducted (5:113-120) in which scores on variables in the Personal Preference Schedule have been correlated with other personality variables such as the Minnesota Multiphasic Personality Inventory (MMPI) and the California Personality Inventory. The correlations generally have not been high, and do not seem to present a consistent or meaningful pattern. Among the reasons for failure to obtain meaningful results might be the fact that the MMPI has been standardized on an abnormal population and the California Personality Inventory is still undergoing validation.

In summary, it must be concluded that the Edwards Personal Preference Schedule has not been adequately validated for certain uses, such as individual prediction. The author himself recognizes some of these limitations and cautions users that the Personal Preference Schedule "was designed primarily as an instrument for research and counseling purposes . . ." (14:4) In spite of its limitations and the fact that it must be considered as an experimental instrument, the Personal Preference Schedule is believed to be adequate for use in the

present study which is primarily exploratory in nature.

Inventory of Beliefs

The Inventory of Beliefs was selected as a measure of stereotypy in students participating in the study.

Description The Inventory of Beliefs is a 120-item non-cognitive instrument designed originally to measure the outcomes of college general education. The individual responds to each item along a four-point scale from strongly agree to strongly disagree. Since the Inventory of Beliefs is a measure of the degree to which an individual tends to accept or reject stereotyped statements in a number of different areas, the resulting score has been used as a measure of stereotypy. It is in the latter context that the instrument is used in this study. A high score results from frequent rejection of stereotyped statements and, therefore, represents a low degree of stereotypy. Conversely, a low score reflects a high degree of stereotypy.

Reliability Reported studies of reliability indicate that the Inventory of Beliefs is sufficiently stable to warrant use for the purpose of either group or individual measurement. The manual reports thirty reliability studies in which a variety of techniques were employed--Kuder-Richardson, test-retest, split-half and parallel form. Coefficients were obtained ranging from .68 to .95 with a median of .86. In all but eight of these studies the groups ranged in size from 100 to a maximum of 370 students. Lehmann and Ikenberry (27) report an internal consistency reliability coefficient of .86, using the split-half technique. The number of subjects on which this estimate was obtained was 2,746.

Validity Content validity was achieved by obtaining a large number of "pseudo-rational, cliché-like" statements from faculty members of various educational institutions. From these and from additional statements obtained from published questionnaires, inventories and personality tests the present 120-item test was developed.

The manual reports evidence of validity from two other sources: (1) correlation with other tests, and (2) analysis of differences between extreme scorers. As an illustration of the former, results on the Inventory of Beliefs were compared with those on measures of more intellectual and cognitive factors, such as the American College Entrance Psychological Examination and Tests of Critical Thinking. The low and positive correlation between the Inventory of Beliefs and these latter measures, was taken as a demonstration of the non-cognitive nature of the dimensions being measured by the Inventory. These results suggest that the Inventory measures certain dimensions of personality.

Occupational Preference Sheet

The Occupational Preference Sheet was constructed for the present study to measure the extent to which students are traditional in contrast to non-traditional in their occupational preferences.

Description and Construction The Occupational Preference Sheet is an empirically devised scale containing nineteen items (see Appendix A). Each item consists of three occupations which have been designated "traditional," "less-traditional" and "non-traditional." In each triad the subject chooses the occupation she prefers most and the one she prefers least. A low score on the Occupational Preference Sheet indicates that the subject is traditional in her outlook, i.e. she prefers

traditional women's occupations over less traditional ones, while a high score indicates a less traditional outlook in terms of occupations.

The "traditional" occupations were derived by soliciting the judgments of ten experienced college counselors. They were asked to list a minimum of ten occupations that would meet the following criteria:

> "These are positions (1) that the majority of college undergraduate women (at Michigan State University) would perceive as typically feminine and would chooce as a career, on either a long or short term basis, (2) that, in terms of general cultural expectations, a college woman would most often be expected to engage in and, in turn, would prepare for, and (3) that you regard as extensions of the typical female role in our culture."

Those occupations listed most often by the judges were selected as "traditional" occupations for the scale. There was at least 80% agreement by the judges on ten of the occupations they listed. A few additional occupations were obtained by screening the 1950 U. S. Census Report (58) for occupations in which are employed many more women than men. Comparing the occupations chosen by the judges as "traditional" against Census figures, it was found that those occupations successfully met the criterion that many more women than men are employed in them. The traditional occupations are listed below. An asterisk precedes occupations chosen by the judges.

*private secretary
*interior decorator
*dietician
*elementary teacher
*medical technician
*nurse
*social worker (used twice)
*high school teacher
*department store buyer
*occupational therapist
*home economics teacher
*Y.W.C.A. official
*dental hygenist
bank teller
hotel manager
physical education teacher
*marriage counselor
*librarian

A "less- traditional" occupation is defined as (1) an occupation listed infrequently, or not at all, as a traditional occupation by the ten judges used in the study, (2) an occupation in which there are relatively large numbers of both men and women, and (3) an occupation in which the percentage of the total number of women in the labor force found in this occupation is approximately the same as the percentage of the total number of men in the labor force who are found in the same occupation. In a few instances, where Census figures were not available, this classification was arrived at by consulting the judges previously mentioned or other authorities on the subject. The designation "less traditional" signifies that this occupation lies in an intermediate position in terms of the traditional--non-traditional continuum discussed previously. The final list of occupations in the "less-traditional" category is given below. An asterisk precedes those occupations obtained directly from Census figures.

interpreter
*author
*musician
speech correctionist
*newspaper reporter
*magazine writer
*artist
physical therapist
*dress designer
*dance instructor
model
*script writer
travel consultant
*stage designer
columnist
social science teacher
*T.V. entertainer
*actress
advertising writer

The remaining occupation in each triad is designated "non-traditional." A non-traditional occupation is defined as (1) one in which many more men are employed than are women, (2) one in which the percentage of the total number of men in the labor force who are found in this occupation is substantially greater than the percentage of the total number of women in the labor force who are found in the same occupation, and (3)

one which, more than likely, would be perceived by most people in our society as a typical man's occupation rather than a typical woman's occupation. The "non-traditional" occupations are listed below. An asterisk precedes occupations obtained directly from Census figures.

*accountant
*advertising agent
*photographer
mathematician
*insurance agent
scientific research worker
*dentist
*lawyer
*pharmacist
*personnel manager (used twice)
horticulturist
commercial artist
employment interviewer
*specialty salesman
statistician
physical science teacher
*stockbroker
*architect

It will be noted that most of the occupations listed are fairly high level. In fact, the majority of them fall into the U. S. Census Bureau classification of professional, technical and kindred workers. This is not surprising in view of the fact that most of the students in the study will be college graduates.

Scoring Procedure Because the occupations in each of the nineteen triads on the Occupational Preference Sheet represent, by definition, varying degrees of a "traditionality" variable, the scoring procedure adopted was one which takes this fact into account. Under the weighting system devised, preference for the "non-traditional" occupation in an item was given a high weight, while preference for the "traditional" occupation was given a low weight. Preference for a "less-traditional" occupation was given an intermediate weight. The scoring procedure is outlined in Table 3.1. Each individual has six possible combinations or alternatives by which he can indicate his "like most" and "like least" choice for each item (triad) on the Occupational Preference Sheet. Each alternative is assigned an appropriate weight. In order to simplify

scoring and subsequent statistical procedures these raw score weights were converted into whole integers, as shown. Using this scoring procedure it is possible to obtain a total score ranging from 0 to 114 (6 x 19).

TABLE 3.1

DESCRIPTION OF THE WEIGHTING AND SCORING PROCEDURE ADOPTED FOR THE OCCUPATIONAL PREFERENCE SHEET

Type of Occupation	Examples of All Possible Answers (Legend: LM--Like Most, LL--Like Least)					
	LM LL	LM LL	LM LL	LM LL	LM LL	LM LL
Traditional	☐ X	☐ X	☐ ☐	☐ ☐	X ☐	X ☐
Less-Traditional	☐ ☐	X ☐	☐ X	X ☐	☐ X	☐ ☐
Non-Traditional	X ☐	☐ ☐	X ☐	☐ X	☐ ☐	☐ X
Raw Score Weight	+3	+2	+1	(0) -1	-2	-3
Converted Weight	6	5	4	(3) 2	1	0

An attempt was made to lessen the possibility of subjects choosing an occupation on the basis of its perceived status or prestige level. This was accomplished by matching the occupations within each triad in terms of "level," using Roe's classification (42:149)

Reliability Reliability is the likelihood that an individual will respond in a consistent manner to repetition of the same test or an equivalent test over different time intervals. There are four major procedures that may be used to provide reliability estimates. These are often designated as test-retest and internal consistency estimates. A test-retest reliability estimate can be obtained by (1) administration of two equivalent tests and correlation of the resulting scores, or (2)

repeated administration of the same test form or testing procedure and correlation of the resulting scores. An estimate of internal consistency can be obtained from (1) subdivision of a single test into two presumably equivalent groups of items, each scored separately, and correlation of the resulting two scores, or (2) analysis of variance among individual items, and determination of the error variance therefrom. (54:574-575)

Internal Consistency Estimate In the present study an analysis of variance technique was used similar to that outlined, in general terms, by Hoyt (22). The more specific procedure and formulae are described in detail by Cronbach (10). This technique has the advantage over the split-half technique of making use of all the information about consistency of performance from item to item within the test and thus provides a unique measure of internal consistency.

Using the analysis of variance technique, a reliability estimate of .62 was obtained for thirty-six subjects in the pilot study. A reliability estimate of .57 was obtained in the final study with eighty-six subjects. These estimates were considered acceptable, although reliability estimates of higher magnitude would have been desirable. Acceptability was further based upon the fact that an estimate of internal consistency of a test is usually considered to be the lower boundary of reliability that would be found by some other method of determining reliability, such as test-retest using equivalent forms (10:331).

Test-Retest Estimate As a further check on reliability of the Occupational Preference Sheet, a test-retest estimate was obtained. The thirty-six subjects in the pilot study were asked to complete an identical form of the instrument approximately one month after the first adminis-

tration. The format of the second test was different in that (1) additional items were included, (2) order of appearance of items was changed, and (3) subjects were told they were being given a revised form of the original test. The retest contained the original nineteen items. Twenty-one of the thirty-six subjects completed the form. Scores on the first and second testing were compared and a test-retest coefficient of .91 was obtained. As was anticipated, the measure of internal consistency (.62) yields a lower estimate of the reliability of the test.

Validity As previously stated, validity is defined as the extent to which a test actually measures what it purports to measure. The principal types of validity are designated empirical, construct, predictive, concurrent and content. Empirical validity is defined as the extent to which an instrument correlates with an external criterion. Under this definition it overlaps with and is in many respects an integral part of other types of validity, especially construct, predictive and concurrent validity. This is particularly true in social science fields where the external criterion often can only be inferred or measured indirectly.

Construct and content validation was established in the development of the Occupational Preference Sheet. The final study was designed to demonstrate both predictive and concurrent validity of the instrument.

Construct Validity In discussing construct validity Cronbach states:

> "Construct validation is an analysis of the meaning of test scores in terms of psychological concepts . . . Sometimes the tester starts with a test he wishes to understand better. Sometimes he starts with a concept for which he wishes a measuring instrument." (11:120)

The procedures he prescribes for achieving construct validation are (11:121):

1. Suggest what constructs might account for test performance through observation or logical study of the test.

2. Derive testable hypotheses from the theory surrounding the construct.

3. Carry out an empirical study to test the hypotheses.

Under the assumption that women's vocational development is shaped by sociological and psychological factors associated with her sex-role, the hypothetical construct of a "traditional--non-traditional"continuum was formulated to account for occupational preferences, in the present study. Hypothetical models were developed to describe the type of woman expected at either end of the continuum. The models of a "traditional" and a "non-traditional" woman were based upon the results of prior observation, study and research, and to some extent upon logical inference and speculation on the part of the tester. Having developed these models, there remained the simpler task of determining how to categorize women's occupations in terms of the models. It was found that women's occupations seemed to fall logically into three categories designated as "traditional," "less-traditional" and "non-traditional." Test items consisted of occupations which conform to the definitions for these categories and the scoring procedure reflected the differences between categories as they would be inferred from the original construct.

The two remaining steps in construct validation were then carried out. Testable hypotheses were derived and an empirical study was carried out to test these hypotheses.

Content Validity Content validity requires logical examination of the test and methods used in its preparation. It is achieved when test items can be shown to be logically relevant to the performance it is designed to measure or to some immediately derived criteria. Content validity was achieved in the Occupational Preference Sheet by (1) selection of occupations women actually engage in, to measure their occupational preferences, (2) a priori definition of categories into which occupations were to be placed, and (3) use of official Census figures and expert opinion to determine what occupations would be used in the items contained in the instrument.

Concurrent and Predictive Validity Concurrent validity is defined as a measure of the correspondence between test results and the present status of individuals, while predictive validity is defined as a measure of the correspondence of test scores and the actual performance or status of individuals at a given interval after testing. The former asks how well individuals score who have achieved a certain status; the latter asks how well the scores on the test correspond with some future achievement.

An attempt was made in the study to demonstrate concurrent validity of the Occupational Preference Sheet. This was accomplished by selection of curricular groups in such a way that they represent various points along the "traditional--non-traditional" continuum, and, at the same time, correspond to the three categories of occupations in the Occupational Preference Sheet--"traditional," "less-traditonal" and "non-traditional." The "traditional" area is represented by home economics, the "less-traditional" area by medical technology and journalism-advertising, and the "non-

traditional" area by mathematics-chemistry. Concurrent validity will have been demonstrated in the present study if the mean scores of the various curricular groups are consistent with the conceptual framework of the study, i.e. if those in the "traditional" curricular group tend to be most traditional in their occupational preferences (low scorers), those in the "non-traditional" group tend to be least traditional in their occupational preferences (high scorers), and those in the "less-traditional" group tend to score in an intermediate position on the Occupational Preference Sheet.

Questionnaire

A questionnaire designed by the experimenter was administered to each student in the final study. See Appendix B for sample copy. The purpose of the questionnaire was to obtain information (1) that was pertinent to the investigation, (2) that might provide insight into the results obtained on the standardized instruments, and (3) that might be used in non-parametric tests of relationship between independent variables measured by the questionnaire and dependent variables in the study. In addition to biographical data, information was requested concerning parental level of education and occupational background, and the individual's marriage and career plans. A ten-item scale covering opinion about the proper role of women in regard to work was also included. Finally each subject was asked to select from four alternatives the career pattern most descriptive of what she actually planned to do. These alternatives ranged from a typical homemaking career to a full-time working career. Two are considered to be traditional patterns and the remaining two, non-traditional, in the context of the study.

The Pilot Study

A pilot study was conducted prior to the final study to (1) test preliminary hypotheses, (2) evaluate and make necessary revisions of the Occupational Preference Sheet, and (3) determine the feasibility of launching a more extensive study of certain aspects of women's career development.

The problem the pilot study was concerned with was to investigate the relationship between undergraduate college women's occupational preferences and the degree of stereotypy in their beliefs.

The population consisted of undergraduate women at Michigan State University. The sample size was thirty-six, selected primarily on the basis of availability and comprised of juniors and seniors. Except for an over-representation of girls with a major in home economics education (thirteen in number), there were approximately equal numbers from the remaining colleges in the university. An exception to this was the College of Engineering, with was not represented.

The instruments used were the Inventory of Beliefs, Rokeach's Dogmatism Scale and the Occupational Preference Sheet. After analyzing the results it was found that the Inventory of Beliefs distinguished among individuals more satisfactorily than the Dogmatism Scale. For this reason the Inventory of Beliefs was selected for the final study.

The major hypothesis being tested was that there would be a significant relationship between scores on the Occupational Preference Sheet and scores on (1) the Inventory of Beliefs, and (2) the Dogmatism Scale. This hypothesis was supported for the Inventory of Beliefs by a correlation coefficient significant at the 5% level of confidence. It was not supported for the Dogmatism Scale.

Taking into consideration limitations in sampling procedures, the following conclusions were reached on the basis of the pilot study:

1. Women students who express a preference for traditional women's occupations tend to be more highly stereotyped on the Inventory of Beliefs, and women who choose less traditional occupations tend to be less stereotyped.

2. Among those with the same choice of major (home economics education) there was a tendency for those who preferred traditional women's occupations to be more stereotyped in their beliefs than those who preferred less traditional ones.

Population and Samples in Final Study

Undergraduate women students enrolled at Michigan State University constitute the population in the final study. The sample consists of upper school women students in four curricular areas--home economics, journalism-advertising, medical technology and mathematics-chemistry. The official criterion for upper school standing is the completion of ninety-two term credits, which is equivalent to junior class standing. This limitation was imposed on the grounds that choice of a major area of study is more stable for juniors and seniors than for lower classmen. In other words, it is assumed that upper school women, if they pursue a career, will be more likely to engage in work related to their major area of preparation, than will women of freshman and sophomore standing. Mathematics and chemistry majors are grouped together because (1) these are believed to be related areas, and (2) there were not sufficient students in either group to provide an adequate-sized separate sample. The same principle applies to combining journalism and advertising into

the field of communication arts. Married students were not included in the samples selected.

The rationale for choosing these particular curricular areas is as follows. First, it was desired to have areas that could be classified in terms of the traditional--non-traditional concept discussed previously. Thus, home economics represents a traditional field of study, one in which women students would be expected (1) to score consistently lower (more traditional) on the Occupational Preference Sheet, (2) to score lower on the Inventory of Beliefs (more stereotyped), and (3) to score differently on needs measured by the Edwards Personal Preference Schedule, than women in a less traditional field of study. The mathematics-chemistry group, on the other hand, represents a non-traditional area, one in which women would be expected to be less traditional in their occupational preferences, less stereotyped, and to score differently on variables measured by the Personal Preference Schedule. Journalism-advertising is believed to be representative of a less traditional type of occupation and, therefore, is in an intermediate position between the two above-named majors. Although medical technology is, by definition, a traditional occupation, it is believed that students in this area will be somewhat less traditional than home economics majors in respect to the variables being studied. The major justification for this latter statement is that the mathematics and science requirements in the medical technology program would appear to make it less visibly tied to the traditional homemaking role than would home economics. Medical technology might therefore be expected to attract students with a somewhat less traditional orientation. In terms of position along a continuum, the medical technology group is expected to occupy an intermediate position between the journalism-

advertising and home economics groups.

Due to the relatively small number of students in the three curricular areas of journalism-advertising, mathematics-chemistry and medical technology, 100% sampling was attempted. Inspection of American Council on Education Psychological Examination (ACE) scores showed a larger proportion of low scorers in the home economics group than in the remaining three groups. Therefore, a stratified random sample was selected in order to reduce the possibility that differences on measures used in the study might be attributed to differences in intellectual ability. The home economics sample was selected on a random basis and in such a way that ACE scores of these students were in equal proportion to the ACE scores of students in the medical technology and journalism-advertising groups. If 40% of those in the latter two groups had an ACE converted score of 6[1], then a like percentage of 6's was included in the home economics sample. Stratification with the mathematics-chemistry group was not considered feasible because of the disproportionately large number of high ACE scores. The use of a stratified random sampling design instead of simple randomization for the home economics group imposes limitations on the statistical handling of the data and also limits the degree to which results can be generalized to another home economics population. Nevertheless, these limitations were favored over the limitation of obtaining differences on the various measures that

[1]It is university policy to convert raw scores on the ACE to standard scores. Under this system, raw scores are converted to standard scores, using a ten interval scale (1-10). The converted standard scores conform basically to a normal curve model, i.e. the per cent of cases under the middle portion is considerably greater than the per cent under the outer portions. For example, an ACE total score of 6 is received by 22% of the students, while a total score of 9 is received by only 3%.

could be attributed to differences in intelligence between groups. It is somewhat of a paradox to find that in attempting to control a cognitive independent variable such as intelligence one risks the possibility of sample bias on various non-cognitive variables.

Students were contacted by mail, with a telephone follow-up, and asked to report to the testing room at the university Counseling Center. The number of women for whom the test battery was complete and usable was eighty-six. See Table 3.2 for data on the final sample. On the basis of inspection each curricular group appears to be representative of the larger sample from which it is taken, with the possible exception of the home economics group. The return of twenty in a sample of forty-five home economics majors raises a question as to the representiveness of the sample. It becomes obvious that non-returns pose a serious limitation in the study.

It will be noted from Table 3.2 that there is little difference between mean ACE scores for three groups: home economics (M = 6.35), medical technology (M = 6.25), and journalism-advertising (M = 6.67). The mean score of the mathematics-chemistry sample (M = 8.12) is considerably higher. Using analysis of variance technique, it was discovered that there is a significant difference, at the 1% level of confidence, between mean ACE scores for the four groups, that of the mathematics-chemistry group being significantly larger than any of the remaining three. Those in the mathematics-chemistry sample are considerably higher in intellectual ability. Those in the remaining three groups are comparatively equal in intellectual ability. ACE scores reported are converted standard scores.

TABLE 3.2

DATA ON SAMPLE RETURNS AND MEAN ACE SCORES
OF STUDENTS IN EACH CURRICULAR AREA

Curricular Areas	Selected Sample		Final Sample Returns	
	Number of Students	Mean ACE Total Score (Converted)	Number of Students	Mean ACE Total Score (Converted)
Home Economics	45	6.11	20	6.35
Journalism-Advertising	29	6.79	21	6.67
Mathematics-Chemistry	31	7.97	25	8.12
Medical Technology	28	6.07	20	6.25

Descriptive Data Obtained for Samples

Questionnaire data which provide pertinent descriptive information on the samples used in the study are reported in Tables 3.3 through 3.7.

Parents' Education Subjects were asked to check the highest level of education completed by parents. Allowing eight years for completion of grade school, twelve years for completion of high school and sixteen years for completion of college, the average number of years of education were computed and are shown in Tables 3.3 and 3.4

TABLE 3.3

FATHER'S EDUCATION

Curricular Areas	Highest Level Completed						N	Average No. of Years Completed
	No. Completing Grade School (8 years)		No. Completing High School (12 years)		No. Completing College (16 years)			
Home Economics	1	(5%)	7	(35%)	12	(60%)	20	14.30
Medical Technology	2	(10%)	11	(55%)	7	(35%)	20	13.35
Journalism-Advertising	2	(10%)	13	(62%)	6	(28%)	21	13.14
Mathematics-Chemistry	7	(28%)	7	(28%)	11	(44%)	25	13.16
Totals	12	(14%)	38	(44%)	36	(42%)	86	13.47

TABLE 3.4

MOTHER'S EDUCATION

	Highest Level Completed						N	Average No. of Years Completed
	No. Completing Grade School (8 years)		No. Completing High School (12 years)		No. Completing College (16 years)			
Home Economics	4	(20%)	8	(40%)	8	(40%)	20	13.05
Medical Technology	2	(10%)	15	(75%)	3	(15%)	20	12.40
Journalism-Advertising	3	(14%)	13	(62%)	5	(24%)	21	12.43
Mathematics-Chemistry	4	(16%)	13	(52%)	8	(32%)	25	12.80
Totals	13	(15%)	49	(57%)	24	(28%)	86	12.67

Mother's Work History Mother's work history was divided into four categories: (1) never worked, (2) worked previously but not working at the time of the study, (3) working part-time, and (4) working full-time. See Table 3.5.

TABLE 3.5

MOTHER'S WORK HISTORY

Work Category	Home Economics	Medical Technology	Journalism-Advertising	Mathematics Chemistry	Totals
Never worked	9 (45%)	6 (30%)	2 (10%)	7 (28%)	24 (28%)
Worked previously	3 (15%)	5 (25%)	7 (33%)	8 (32%)	23 (27%)
Working part-time	2 (10%)	2 (10%)	4 (19%)	1 (4%)	9 (10%)
Working full time	6 (30%)	7 (35%)	8 (38%)	9 (36%)	30 (35%)
Totals	20	20	21	25	86

Women's Opinions About Their Proper Work Role The ten statements on page three of the Questionnaire (Appendix B) are designed to measure the extent to which a woman tends to agree with common stereotyped statements

concerning women and work. Agreement with a large number of the statements suggests a woman is traditional in her outlook, while agreement with few or none of the statements is taken as an indication of a more liberal or less traditional outlook. A score of one (1) was given each time a subject marked the agree category, and a score of zero (0) was given for each disagree response. Thus, the range of possible scores is zero through ten. The distribution of scores obtained in shown in Table 3.6.

TABLE 3.6

SCORES OF THE FOUR CURRICULAR GROUPS ON THE TEN QUESTIONNAIRE STATEMENTS REFLECTING WOMEN'S OPINION ABOUT THEIR PROPER WORK ROLE

Range of Scores	Number Receiving Given Score in each Curricular Area				Number Receiving Given Score in the Four Groups (Combined)
	Home Economics	Medical Technology	Journalism-Advertising	Mathematics-Chemistry	
0	1	0	4	3	8
1	3	4	6	5	18
2	1	1	3	7	12
3	7	11	4	3	25
4	5	2	1	4	12
5	2	1	0	1	4
6	1	1	0	1	3
7	0	0	1	1	2
8	0	0	2	0	2
Totals	20	20	21	25	86
Median Scores	3	3	2	2	3

Choice of Career Pattern On page four of the Questionnaire (Appendix B) are listed four possible patterns a woman might follow. The first two alternatives describe a relatively conventional pattern emphasizing the homemaking role, while the latter two place equal or greater

emphasis on the pursuit of a career, either in conjunction with or in lieu of homemaking. The frequency of choice of the various patterns by curricular group is given in Table 3.7. It should be remembered that pattern choices 1 and 2 represent conventional (traditional) career patterns and alternatives 3 and 4, less conventional (non-traditional) career patterns.

TABLE 3.7

CAREER PATTERN CHOICES OF WOMEN IN THE FOUR CURRICULAR GROUPS

Pattern Designation	Home Economics	Medical Technology	Journalism-Advertising	Mathematics Chemistry	Totals
1	3	0	1	2	6
2	10	8	8	9	35
3	4	10	9	11	34
4	3	2	3	3	11
Totals	20	20	21	25	86

Hypotheses

The major hypotheses tested in the study are stated in this section in the null and alternate form. The null hypothesis is concerned primarily with differences between groups that depart from chance expectation. The alternate hypothesis in each case is concerned with the direction of the differences that are found.

Hypothesis 1: There is no significant difference between mean scores of the four curricular groups on the Occupational Preference Sheet.

> Alternate Hypothesis: The mathematics-chemistry group will have the highest mean score on the Occupational Preference Sheet, and there will be progressively smaller scores in the journalism-advertising, medical technology and home economics groups, respectively.

Hypothesis 2: There is no significant difference between the mean score of the combined home economics and medical technology groups, and the mean score of the combined mathematics-chemistry and journalism-advertising groups on the Occupational Preference Sheet.

Alternate Hypothesis: The mean score of the combined home economics and medical technology groups on the Occupational Preference Sheet will be significantly smaller than the mean score of the combined mathematics-chemistry and journalism-advertising groups.

Hypothesis 3: There will be no significant difference between the mean scores of the four curricular groups on the Inventory of Beliefs.

Alternate Hypothesis: The mathematics-chemistry group will have the highest mean score on the Inventory of Beliefs and there will be progressively smaller mean scores in the journalism-advertising, medical technology and home economics groups, respectively.

Hypothesis 4: There is no significant difference between the mean score of the combined home economics and medical technology groups, and the mean score of the combined mathematics-chemistry and journalism-advertising groups on the Inventory of Beliefs.

Alternate Hypothesis: The mean score of the combined home economics and medical technology groups on the Inventory of Beliefs will be significantly smaller than the mean score of the combined mathematics-chemistry and journalism-advertising groups.

Hypothesis 5: There is no significant relationship between scores on the Occupational Preference Sheet and scores on the Inventory of Beliefs among the four curricular groups, separately and collectively.

Alternate Hypothesis 5a: There will be a significant positive correlation between scores on the Occupational Preference Sheet and scores on the Inventory of Beliefs in each of the four curricular groups separately: home economics, journalism-advertising, mathematics-chemistry and medical technology.

Alternate Hypothesis 5b: There will be a significant positive relationship between scores on the Occupational Preference Sheet and scores on the Inventory of Beliefs in the four curricular groups combined.

Hypothesis 6: There is no significant difference between mean scores of the four curricular groups on the manifest needs (1) achievement, (2) autonomy, (3) dominance, (4) endurance, (5) aggression, (6) deference, (7) abasement, and (8) nurturance.

Alternate Hypothesis 6a: The mathematics-chemistry group will have the highest mean score and there will be progressively smaller mean scores in the journalism-advertising, medical technology and home economics groups, respectively, on the manifest needs (1) achievement, (2) autonomy, (3) dominance, (4) endurance, and (5) aggression.

Alternate Hypothesis 6b: The home economics group will have the highest mean score and there will be progressively smaller mean scores in the medical technology, journalism-advertising and mathematics-chemistry groups, respectively, on the manifest needs (1) deference, (2) abasement, and (3) nurturance.

Statistical Analysis of the Data

The statistical procedures used in analyzing the data will be presented in this section. Analysis of variance and the "t" test models were used to test several hypotheses because these models (1) have been shown to be effective for use with small samples, and (2) are appropriate for use with parametric data. Correlation technique, although a less sensitive statistical tool, was used for testing one hypothesis because parametric data were available and because information was desired as to the extent to which scores on two measures varied concomitantly. A chi square model was used to analyze some of the non-parametric data. While it is the least sensitive of the statistical tools it was considered appropriate for the purpose intended.

The assumptions underlying each test will be presented. If the assumptions underlying a statistical test are not adequately met, the possibility arises that obtained differences may be the result of failure to satisfy the assumptions rather than the result of actual differences.

Analysis of Variance

The major assumptions underlying the F-test for simple randomized designs (28:27) are:

1. The groups are drawn at random from the same parent population. This assumption is adequately met in three groups, in which 70-80% of the total available subjects were obtained. The stratified random sampling procedure used in the fourth group, home economics, represents a departure from simple randomization. The latter limitation must be taken into consideration in interpretation of results.

2. The groups are homogeneous in variability. Research by Norton (28:86) indicates that heterogeneity of variance must be extreme to be of serious consequence. Visual inspection revealed no serious departure from this assumption. Therefore, no test was made of homogeneity for variance.

3. The distribution of criterion measures for each treatment population is normal. The Norton study demonstrated that the F-distribution is fairly insensitive to the form of the distribution of the criterion measures and that departure from normality will probably have no appreciable effect on the results unless the departure is so extreme as to be obvious from visual inspection. This assumption was so met.

4. The mean of the criterion measures is the same for each treatment population. This is the null hypothesis that is being tested.

Tukey's Technique It was decided that Tukey's technique (15:330-335) would be used to analyze the differences among means if the F-test resulted in rejection of the null hypothesis that there is no difference between means. Tukey's procedure permits the experimenter to classify means into groups that are alike among themselves but that differ from each other. He prescribes three tests for making such classifications; designated as the test for (1) a "significant gap," (2) a "straggler," and (3) "excessive variability."

The test for a "significant gap" is applied to separate the means into "groups" that are significantly different from each other. If, after application of the test for a "significant gap," there are three or more means remaining in any group, the test for a "straggler" is used. The latter test indicates whether any mean in a group of three or more means is significantly different from the remaining means in its respective group. If three or more means still remain in any group after application of these two tests, a final test for "excessive variability" can be applied. The test for "excessive variability" makes use of an estimate of the variance among means in any remaining group of three or more to determine if any mean differs significantly from those in its respective group.

"t" Test

The "t" test for independent samples was used to test for the difference between two means in hypotheses 2 and 4. The major assumptions underlying this test are (1) random selection of groups, (2) independence of means, (3) homogeneity of variance, and (4) normality of distribution of criterion measures. Assumption one is met to the same extent as the first assumption for the F-test, outlined previously. The second assumption was met by the manner in which the samples were selected. The latter two assumptions are accepted on the basis of visual inspection of the data.

Product Moment Correlation

The product moment correlation (Pearson r) technique (15:169-170) was used to determine the degree of relationship between scores on the Inventory of Beliefs and the Occupational Preference Sheet. The most

important requirement for legitimate use of the Pearson r is that the relationship between the two variables (X and Y) be rectilinear, i.e. a straight-line regression. Although there is no requirement that the Pearson r be computed only for normal distributions, it is important that the distributions be symmetrical (homoscedastic). Inspection of a scattergram for the two distributions used in computing the correlation coefficient in the present study indicates that the assumptions are adequately met.

Chi Square (X^2)

The chi square test is used in this study primarily as a test of independence. If the variables are independent, chi square should be no larger than would arise by chance. On the other hand, the finding of a significant chi square indicates lack of independence and can be considered as evidence for correlation of the variables.

In using the chi square test of significance (20:221-222) it is assumed (1) the distribution of the measures being tested are continuous, (2) the sampling distribution of the observed frequencies around a given E (expected frequency) follows the normal curve, and (3) the observations are independent of one another. It is seldom feasible to check on the first two assumptions. However, these assumptions are considered to have been met if the expected cell frequencies are sufficiently large, preferably ten or larger. The third assumption is met if the total of the observed frequencies does not exceed the number of persons in the entire sample. All the assumptions were adequately met.

Level of Significance

The level of significance for accepting or rejecting all null hypotheses

was set at 5% prior to analyzing the results. The same level of significance is applied to the alternate hypotheses in which a one-tailed test of significance is employed. Use of the 5% level in the latter case is believed justified because the study is exploratory in nature. One purpose of such a study is to generate further hypotheses and furnish new leads. Therefore, the experimenter is more interested in reducing the possibility of rejecting a hypothesis that is in reality true (Type I error) and is less concerned with the increased risk of retaining a false hypothesis (Type II error).

Limitations

The major known limitations are believed to be in respect to the sampling procedure and the instruments used. In the first place, there is a difference in intellectual ability in the case of the mathematics-chemistry group. In addition, the combining of students from similar curricular groups (mathematics with chemistry, journalism with advertising) because of the limited number of students available, will make it difficult to generalize to the separate groups involved. Because 100% sampling was not achieved for groups in the final sample, it is not known to what extent those who responded are representative of their curricular area in terms of personal characteristics that may be important to the outcome of the study. The latter limitation is most applicable to the home economics group, in which the return for the final sample was only 44% of the total.

No cross-validation was carried out with independent samples from the same population. Consequently, the question of how well the results hold up in other situations remains unanswered.

There are questions concerning the validity of instruments used in the study. This is to be expected in the case of the Occupational Preference Sheet which was used for the first time. Although validity has not been well-established for both the Inventory of Beliefs and the Edwards Personal Preference Schedule, these instruments are considered satisfactory for a study which is essentially exploratory in nature.

The low reliability of the Occupational Preference Sheet has already been noted and has to be considered as a limitation. However, as pointed out previously, the reliability estimates of .62 in the pilot study and .57 in the final study are considered to be a lower boundary of the reliability of the instrument. In any case, low reliability is expected to have the effect of making it more difficult to reach the required level of significance in testing the null hypotheses.

An examination of the list of non-traditional occupations which was compiled long before the selection of curricular groups was made, reveals another possible limitation of the Occupational Preference Sheet. Such examination reveals that there may be an unintentional bias in favor of occupations requiring background and training in mathematics and/or science. Eight of the nineteen occupations listed seem to fall into this category (e.g. mathematician, scientific research worker, dentist, pharamacist, statistician, horticulturalist, physical science teacher and architect).

Summary

The instruments used in the study are described and information is furnished concerning validity and reliability. The Inventory of Beliefs was used in the study to measure stereotypic thinking. The Edwards Per-

sonal Preference Schedule was used to measure manifest needs. The Occupational Preference Sheet was constructed for the purpose of measuring the extent to which an individual is traditional or non-traditional in her preference for occupations.

A pilot study showed that the Occupational Preference Sheet seemed to be satisfactorily differentiating between students who preferred traditional occupations as opposed to those preferring non-traditional ones. It also demonstrated that there was a relationship between scores on the Occupational Preference Sheet and scores on the Inventory of Beliefs, suggesting the feasibility of conducting a larger study using specific curricular areas.

There is a discussion of the population and sampling procedures employed. The final sample of eighty-six women was composed of juniors and seniors in four curricular areas: home economics, medical technology, mathematics-chemistry and journalism-advertising. The first two were selected as being representative of traditional women's occupations. The latter two represent less traditional occupations.

The major hypotheses to be tested are stated and are followed by a description of the statistical procedures to be used in analysis of the data. Finally, limitations of the study are reviewed.

In the next chapter the data collected through administration of the various instruments will be analyzed and discussed. The last chapter will contain a summary, conclusions, and implications of the study.

CHAPTER IV

ANALYSIS OF THE DATA

The Inventory of Beliefs, Occupational Preference Sheet, Edwards Personal Preference Schedule and a specially designed questionnaire were administered to eighty-six undergraduate women in four curricular areas: home economics, journalism-advertising, mathematics-chemistry, and medical technology. The results obtained through an analysis of the data are reported in this chapter.

To simplify the reporting of results, the following procedure will be followed. Each major hypothesis will be restated and will be accompanied by pertinent results, including a statement of the acceptance or rejection of the hypothesis and an indication of the statistical procedures employed. The findings will then be discussed.

Hypothesis 1

Hypothesis 1: There is no significant difference between mean scores of the four curricular groups on the Occupational Preference Sheet.

> Alternate Hypothesis: The mathematics-chemistry group will have the highest mean score on the Occupational Preference Sheet, and there will be progressively smaller scores in the journalism-advertising, medical technology and home economics groups, respectively.

Findings

The null hypothesis is rejected at the 5% level of confidence, as shown in Table 4.1. The mean score and variance of each treatment group is given in Table 4.2.

TABLE 4.1

ANALYSIS OF THE DIFFERENCE BETWEEN MEANS OF THE FOUR CURRICULAR GROUPS ON THE OCCUPATIONAL PREFERENCE SHEET

Source	Sum of Squares	d.f.	Mean Squares	F
Total	13659.72	85	160.70	
Between Groups	1666.26	3	555.42	3.80*
Within Groups	11993.46	82	146.26	

*Significant beyond the 5% level of confidence

TABLE 4.2

MEAN SCORE AND VARIANCE OF EACH OF THE FOUR CURRICULAR GROUPS ON THE OCCUPATIONAL PREFERENCE SHEET

Curricular Group	Mean	N	Variance
Mathematics Chemistry	63.24	25	137.02
Journalism-Advertising	56.95	21	184.15
Medical Technology	55.70	20	130.85
Home Economics	51.25	20	133.46
General Mean	56.79	86	

TABLE 4.3

CORRELATION BETWEEN MEAN ACE (TOTAL) SCORES AND SCORES ON THE OCCUPATIONAL PREFERENCE SHEET

Curricular Group	N	d.f.	Correlation Coefficient
Mathematics Chemistry	25	23	-.01
Journalism-Advertising	21	19	.30
Medical Technology	20	18	-.02
Home Economics	20	18	.07
Combined Samples	86	84	.25*

*Significant beyond the 5% level of confidence

The alternate hypothesis is accepted for the mathematics-chemistry and home economics groups. Using Tukey's test for a "significant gap" it was found that (1) the mean of the mathematics-chemistry sample is in a "group" by itself and is significantly larger than the means in the remaining "groups," (2) the mean of the home economics sample is in a "group" by itself and is significantly smaller than the means in the remaining "groups," (3) the means of the journalism-advertising and medical technology samples are in a separate "group" with no significant gap between them. No further test is applied if there are fewer than three means in any remaining "group."

Discussion

Inspection of Table 4.2 and the findings pertaining to the alternate hypothesis reveals that the differences between curricular groups are all in the expected direction, two of them significantly so. The mathematics-chemistry group, which was selected as representative of a non-traditional woman's occupation, obtained the highest mean score (least traditional). In contrast, the home economics group, representing a traditional woman's occupation, scored in the most traditional direction on the Occupational Preference Sheet.

The results indicate that the groups differ in terms of the variable measured by the Occupational Preference Sheet. In addition, the results provide evidence of predictive and concurrent validity of the instrument. The findings suggest that the "traditional--non-traditional" concept provides a meaningful approach to studying women's occupational preferences and that it has application to women's vocational development.

The findings are subject to certain limitations. In the first place,

the effect of intellectual factors must be considered. Table 4.3 shows that there is a slight but significant positive correlation between scores on the Occupational Preference Sheet and scores on the American Council on Education Psychological Examination (ACE) for the combined sample of eighty-six. In addition, the superior intellectual ability of the mathematics-chemistry group, as reflected in ACE scores, has already been indicated in Chapter III and may be partly responsible for the significant difference in mean Occupational Preference Sheet score for that group.

The sampling procedure employed for the home economics group, plus the small sample return, poses a question as to reasons why the home economics group scored significantly lower than the remaining groups. The question is whether the differences reflect "true" differences or whether they are due to lack of representativeness or bias in the sample.

A closer examination of the findings provides further insight into differences on the Occupational Preference Sheet. The finding of a "significant gap" between the mathematics-chemistry group mean and the remaining means suggests fairly strongly that the students in these curricular areas are much more non-traditional in their occupational preferences. Whatever the effect of their higher intellectual ability and the fact that the non-traditional occupations on the Occupational Preference Sheet tend to favor background in mathematics and the sciences, the observation must be made that here again this group is <u>different</u>, in that they show a greater preference for occupations that are considered to be typical men's occupations. On the other hand, notice that the home economics group, which appears to be basically no different from two other groups in terms of intellectual ability, parental educational background and career pattern preferences, appear to be significantly more tradi-

tional in their occupational preferences, based on Tukey's procedure. In other words, the students in home economics showed a tendency to choose occupations that might be described as more feminine in nature, and which, by definition, are considered to be extensions of the conventional female role in our culture.

At this point the question arises: (1) Why were the medical technology and journalism-advertising mean scores on the Occupational Preference Sheet not different from each other to a greater extent, and also, why was the medical technology group mean not closer to that of home economics, and the journalism-advertising mean not closer to the mathematics-chemistry mean? Of perhaps greater significance, however, is the corollary question: (2) Why did the medical technology students with their presumedly superior background in science and mathematics tend to score slightly lower on the Occupational Preference Sheet than the journalism-advertising students in view of the fact that the non-traditional occupations favor the areas of science and mathematics, and by the same token, (3) Why did the medical technology mean score not equal or surpass the mean score of the mathematics-chemistry group? Since the prestige or status factor was controlled by matching for level within each triad on the Occupational Preference Sheet, this would not seem to account for such a finding.

The obvious answer to question 1 is that the medical technology and journalism-advertising groups do not differ markedly in their occupational preferences on the instrument used. One explanation to questions 2 and 3 would seem to be that among medical technology students the attraction towards more traditional types of occupations is stronger than the attraction towards more non-traditional occupations, even though the latter would appear to be more related to their previous training and

experience.

Hypothesis 2

Hypothesis 2: There is no significant difference between the mean score of the combined home economics and medical technology groups, and the mean score of the combined mathematics-chemistry and journalism-advertising groups on the Occupational Preference Sheet.

Alternate Hypothesis: The mean score of the combined home economics and medical technology groups on the Occupational Preference Sheet will be significantly smaller than the mean score of the combined mathematics-chemistry and journalism-advertising groups.

Findings

The null hypothesis is rejected at the 1% level of confidence as shown in Table 4.4.

The alternate hypothesis is accepted at the 5% level of confidence, using a one-tailed test of significance.

TABLE 4.4

ANALYSIS OF THE DIFFERENCE BETWEEN MEAN SCORES OF COMBINED CURRICULAR GROUPS ON THE OCCUPATIONAL PREFERENCE SHEET

Combined Groups	N	Combined Mean Score on the Occupational Preference Sheet	d.f.	t
Home Economics, and Medical Technology	20 20			
	40	53.48	84	2.67*
Journalism-Advertising, and Mathematics-Chemistry	25 21			
	46	60.37		

*Significant beyond the 5% level of confidence

Discussion

When curricular groups designated in advance as traditional are combined and their mean score compared with the mean score of combined non-traditional curricular groups, the traditional group tends to score lower on the Occupational Preference Sheet and the non-traditional group, higher, as anticipated. These results in many ways parallel the findings in hypothesis one and are subject to essentially the same limitations in respect to sampling procedure and differences in intellectual ability among groups.

Hypothesis 3

Hypothesis 3: There will be no significant difference between the mean scores of the four curricular groups on the Inventory of Beliefs.

> Alternate Hypothesis: The mathematics-chemistry group will have the highest mean score on the Inventory of Beliefs and there will be progressively smaller mean scores in the journalism-advertising, medical technology and home economics groups, respectively.

Findings

The null hypothesis is rejected at the 1% level of confidence. See Table 4.5.

The alternate hypothesis is accepted for the mathematics-chemistry group, only. Applying Tukey's test for a "significant gap," the mean of the mathematics-chemistry sample is found to be in a "group" by itself and is significantly larger than the means in the remaining "group." The means of journalism-advertising, medical technology and home economics samples fall into a second "group" with no significant gap between them. Tukey's test for a "straggler" was applied to the "group" containing three means. None of the means could be separated on the basis of the "straggler" test. Therefore, the test for "excessive variability" was used on the three

means. No evidence of excessive variability was found. In summary, the journalism-advertising, medical technology and home economics mean scores on the Inventory of Beliefs are not significantly different from each other. Collectively, they are significantly different from the mean score of the mathematics-chemistry sample.

TABLE 4.5

ANALYSIS OF THE DIFFERENCE BETWEEN MEANS OF THE FOUR CURRICULAR GROUPS ON THE INVENTORY OF BELIEFS

Source	Sum of Squares	d.f.	Mean Squares	F
Total	14962.94	85	176.03	
Between Groups	4114.72	3	1371.57	10.37*
Within Groups	10848.22	82	132.30	

*Significant beyond the 1% level of confidence

TABLE 4.6

MEAN SCORE AND VARIANCE OF EACH OF THE FOUR CURRICULAR GROUPS ON THE INVENTORY OF BELIEFS

Curricular Group	Mean	N	Variance
Mathematics-Chemistry	83.76	25	142.94
Journalism-Advertising	77.38	21	199.82
Medical Technology	74.65	20	144.65
Home Economics	77.30	20	200.01
General Mean	78.27	86	

TABLE 4.7

CORRELATION BETWEEN MEAN ACE (TOTAL) SCORES AND SCORES ON THE INVENTORY OF BELIEFS

Curricular Group	N	d.f.	Correlation Coefficient
Mathematics-Chemistry	25	23	-.02
Journalism-Advertising	21	19	.39
Medical Technology	20	18	-.15
Home Economis	20	18	.31
Combined Samples	86	84	.20

Discussion

Exploring the differences in stereotypy, it is found that the mathematics-chemistry group is much different from the remaining three groups. As anticipated, the mathematics-chemistry group proved to be least stereotyped in their beliefs, as measured by the Inventory of Beliefs. Again, their superior intellectual ability may be a major factor in producting this difference. However, the finding of a zero order correlation between scores on the Inventory of Beliefs and scores on the ACE (Table 4.7) suggests that the effect of intelligence may be minimal.

A slight positive correlation was found between scores on the Inventory of Beliefs and scores on the ACE for the combined sample of 86. Because of this fact, the possible effect of intellectual ability on the results must again be considered. Inspection of Table 4.7 shows that in separate groups the correlations vary from a -.15 for home economics to a .39 for journalism-advertising.

The finding of no significant difference between the means of the journalism-advertising, medical technology and home economics groups is

difficult to interpret. Inspection of the means, in Table 4.6, reveals that the means of the journalism-advertising and home economics groups are almost equal on the measure of stereotypy, while the mean of the medical technology group is somewhat lower. A partial explanation of the fact that the home economics group is not lower on the measure of stereotypy than the medical technology group may be in the finding of a positive correlation of .31 between scores on the ACE and the measure of stereotypy for the home economics group, and, in contrast to this, a negative correlation of -.15 between scores on the same two instruments for medical technology. Unfortunately, this observation provides no indication as to the cause-and-effect relationship that may be involved. The question of possible bias and possible lack of representativeness of the home economics group as a result of the sampling procedure used and low sample return must again be considered in interpreting the results.

The finding of limited differences in stereotypy between the three groups, excluding mathematics-chemistry, is in conflict with the finding by Lehmann and Ikenberry (27) that students in both medical technology and home economics scored significantly lower on the Inventory of Beliefs than students in communication arts. Although their study included much larger samples and was conducted with a freshman population, similar trends in stereotypy were anticipated in the present study.

The finding of limited differences is also in conflict with the clinical hunch, supported by the studies of Lehmann and Ikenberry (27) and Stern (48), that a highly stereotyped student would tend to be found majoring in a technical or vocationally-oriented program such as home economics and medical technology, and a less-stereotyped student would tend to be found in a liberal arts type of program such as journalism.

Hypothesis 4

Hypothesis 4: There is no significant difference between the mean score of the combined home economics and medical technology groups, and the mean score of the combined mathematics-chemistry and journalism-advertising groups on the Inventory of Beliefs.

> **Alternate Hypothesis:** The mean score of the combined home economics and medical technology groups on the Inventory of Beliefs will be significantly smaller than the mean score of the combined mathematics-chemistry and journalism-advertising groups.

Findings

The null hypothesis is accepted, using a two-tailed test of significance. See Table 4.8.

The alternate hypothesis is accepted.

TABLE 4.8

AN ANALYSIS OF THE DIFFERENCE BETWEEN MEAN SCORES OF COMBINED CURRICULAR GROUPS ON THE INVENTORY OF BELIEFS

Combined Groups	N	Combined Mean Score on the Inventory of Beliefs	d.f.	t
Home Economics, and Medical Technology	20 20			
	40	75.98	84	1.79
Journalism-Advertising, and Mathematics-Chemistry	21 25			
	46	80.85		

Discussion

It is evident that the trend is for students in non-traditional curricular areas to be less stereotyped in their beliefs than students

in traditional areas. This trend was anticipated and is consistent with the general theoretical framework of the study. Limitations of the study, already extensively discussed, should be given proper consideration.

Hypothesis 5

Hypothesis 5: There is no significant relationship between scores of the Occupational Preference Sheet and scores on the Inventory of Beliefs among the four curricular groups, separately and collectively.

Alternate Hypothesis 5a: There will be a significant positive correlation between scores on the Occupational Preference Sheet and scores on the Inventory of Beliefs in each of the four curricular groups separately: home economics, journalism-advertising, mathematics-chemistry and medical technology.

Alternate Hypothesis 5b: There will be a significant positive relationship between scores on the Occupational Preference Sheet and scores on the Inventory of Beliefs in the four curricular groups combined.

Findings

The null hypothesis is rejected for the home economics groups at the 5% level of confidence; it is accepted in all other cases. The two alternate hypotheses are accepted. See Table 4.9.

TABLE 4.9

CORRELATION BETWEEN SCORES ON THE OCCUPATIONAL PREFERENCE SHEET AND THE INVENTORY OF BELIEFS FOR EACH OF THE FOUR CURRICULAR GROUPS INDIVIDUALLY AND COLLECTIVELY

Curricular Group	N	d.f.	Product Moment Correlation Coefficient
Mathematics-Chemistry	25	23	.04
Journalism-Advertising	21	19	.24
Medical Technology	20	18	.08
Home Economics	20	18	-.49*
Combined Groups	86	84	.05

*Significant at the 5% level of confidence

Discussion

In considering the question as to whether there is a significant relationship between the degree to which women are stereotyped in their thinking and the degree to which they are traditional in their occupational preferences, the results are inconclusive. No significant positive correlation was found between scores on the Occupational Preference Sheet and the Inventory of Beliefs for the sample as a whole. Only a slight positive correlation of .04 was found. A significant negative correlation was found in the home economics group, contrary to expectation.

These findings are somewhat confusing when it is recalled that scores on these same two instruments yielded a positive relationship significant at the 5% level of confidence in the pilot study. It will also be remembered that a positive correlation was found in the present study between ACE mean score and mean score of the home economics group on both the Inventory of Beliefs and the Occupational Preference Sheet. In other words, in spite of the fact that both the Inventory of Beliefs and the Occupational Preference Sheet scores of this group correlated positively with a third measure, ACE scores, a significant negative correlation was found between the Inventory of Beliefs and Occupational Preference Sheet scores, contrary to expectation. This finding in the home economics group of a tendency for the more traditionally oriented student to be least stereotypic, in contrast to the trend in the remaining three groups, suggests that the home economics group may be atypical in some respects. The question of representativeness of this group has already been raised in view of the small sample return and the departure from simple randomization in the sampling procedure.

Because correlation technique represents a less sensitive statistical

tool than analysis of variance or "t" test, the weight given to the findings on hypothesis 5 should be adjusted accordingly. In summary, although the null hypothesis that there is no significant positive relationship between scores on the Occupational Preference Sheet and the Inventory of Beliefs can be accepted in all but one case, there is some evidence to suggest consideration of the possibility that some alternate hypothesis might still be true.

Hypothesis 6

Hypothesis 6: There is no significant difference between mean scores of the four curricular groups on the manifest needs (1) achievement, (2) autonomy, (3) dominance, (4) endurance, (5) aggression, (6) deference, (7) abasement, and (8) nurturance.

Alternate Hypothesis 6a: The mathematics-chemistry group will have the highest mean score and there will be progressively smaller mean scores in the journalism-advertising, medical technology and home economics groups, respectively, on the manifest needs (1) achievement, (2) autonomy, (3) dominance, (4) endurance, and (5) aggression.

Alternate Hypothesis 6b: The home economics group will have the highest mean score and there will be progressively smaller mean scores in the medical technology, journalism-advertising and mathematics-chemistry groups, respectively, on the manifest needs (1) deference, (2) abasement, and (3) nurturance.

Findings

The null and alternate hypotheses are accepted, as shown in Table 4.10.

TABLE 4.10

ANALYSIS OF THE DIFFERENCE BETWEEN MEANS OF THE FOUR CURRICULAR GROUPS ON EIGHT MANIFEST NEEDS MEASURED BY THE EDWARDS PERSONAL PREFERENCE SCHEDULE

Manifest Need	Source	Sum of Squares	d.f.	Mean Squares	F
	Total	1425.58	85		
Achievement	Between Groups	94.35	3	31.45	1.94
	Within Groups	1331.23	82	16.23	
	Total	1446.00	85		
Deference	Between Groups	57.62	3	19.21	1.13
	Within Groups	1388.38	82	16.93	
	Total	2273.08	85		
Dominance	Between Groups	64.07	3	21.36	.79
	Within Groups	2209.01	82	26.94	
	Total	1951.40	85		
Abasement	Between Groups	61.89	3	20.63	.90
	Within Groups	1889.50	82	23.04	
	Total	1759.50	85		
Nurturance	Between Groups	44.90	3	14.97	.72
	Within Groups	1714.60	82	20.91	
	Total	1929.72	85		
Autonomy	Between Groups	28.80	3	9.60	.41
	Within Groups	1900.92	82	23.18	
	Total	2516.84	85		
Endurance	Between Groups	127.21	3	42.40	1.46
	Within Groups	2389.63	82	29.14	
	Total	1951.22	85		
Aggression	Between Groups	112.88	3	37.63	1.68
	Within Groups	1838.34	82	22.42	

Discussion

The finding that there are no significant differences between means of the four curricular groups on any of the manifest needs on which differences were expected is somewhat surprising. There is no apparent explanation of these results and it must be concluded that among the groups used in this study there are no significant differences in needs.

The possibility exists, of course, that there actually are no differences in manifest needs among college students in various curricular areas. It is believed more likely, however, that some other factor or combination of factors may have been operating. For example, it is possible that the groups were of insufficient size for differences in needs to appear. A second possibility is that the instruments used may not be sensitive enough to pick up differences that may exist. In this connection it should also be noted that there are many alternate ways of handling the same basic data. Therefore, the possibility exists that the design and statistical methods employed may not have been the most appropriate for uncovering differences between groups.

The experimental nature of the Personal Preference Schedule and its limited validation must also be weighed in a discussion of results. Take for example the fact that interpretation of scores on the variables measured by the instrument is primarily a matter of clinical judgment. One can only speculate on such questions as the following: Does a high score on a particular need represent long-standing deprivation or a desire to maintain satisfaction in an area where greatest satisfaction has always been found? To what extent do individuals in different fields of study or in different occupations perceive a given occupation as satisfying the same basic need? The answers to such questions must be deferred until further empirical

evidence is available.

In addition to the difficulties already mentioned, there is the additional possibility that, as sometimes happens in the social sciences, there is as yet no adequately satisfactory method of measuring the variables in question. These various explanations are not considered to exhaust the possibilities but merely to underscore the fact that a finding of no significant difference in this study does not necessarily imply that no differences exist. For, as Edwards states, "if we do not reject the (null) hypothesis, this does not necessarily mean that we regard it as true." (15:225)

Questionnaire Results

The questionnaire results, together with the non-parametric tests used to analyze some of the results, will be reported in this section.

The questionnaire administered to each student in the study furnished information about their marriage and career plans, family background, opinions about the proper work role of women and career pattern choices. Some of the results obtained by questionnaire were reported in Tables 3.3 through 3.7. The various data obtained by questionnaire constitute independent variables with which the study was not directly concerned. However, as previously stated, the plan was to relate some of this data to that obtained from the various criterion measures.

The data obtained concerning work history of the mother reported in Table 3.5 does not reveal significant differences among the four groups. The one possible exception to this is the fact that nearly half of the women in the home economics group report that their mothers have never worked, while the percentage so reporting in the other groups is con-

siderably smaller. One might speculate that a cultural factor is responsible for the home economics group being significantly more traditional in their occupational preferences and, furthermore, for their being in that particular choice of major. The cultural factor referred to is that nearly half of the women in home economics were apparently exposed to a primary sex role model--the mother--which epitomizes the homemaking role and which we would have to characterize as one of the more traditional career patterns a woman can follow. Such speculation, if warranted, is consonant with the theoretical framework of the study.

A chi square test, reported in Tables 4.11 and 4.12, was performed to determine if scores on the ten opinion statements were related to scores on both the Inventory of Beliefs and Occupational Preference Sheet in the four curricular groups. A non-significant chi square would suggest the scores are independent and therefore unrelated, while a significant chi square would suggest the scores are related. A two-way contingency table was used for the chi square tests. Scores on each instrument were divided into those above and below the median. The twenty-five students who received a median score of 3 on the ten statements were included with the above median scores. A chi square of 9.24, significant at the 1% level of confidence, was found for the ten statements and the Inventory of Beliefs. A chi square of 4.73, significant at the 5% level of confidence, was found for the ten statements and the Occupational Preference Sheet. Inspection of Tables 4.11 and 4.12 shows that there is a significantly greater than chance expectancy for agreement with the ten stereotyped statements about women in work (above median score) to be accompanied by a tendency to be more stereotyped (below median Inventory of Beliefs score), and to be more traditional in occupational preference (below median Occupational Preference Sheet score).

TABLE 4.11

TWO-WAY CONTINGENCY TABLE FOR QUESTIONNAIRE OPINION SCORES AND INVENTORY OF BELIEF SCORES (N = 86)

Opinion Scores	Inventory of Belief Scores		Totals
	Above Median	Below Median	
Above Median (3-8)	17 (24.00)*	31 (24.00)	48
Below Median (0-2)	26 (19.00)	12 (19.00)	38
Totals	43	43	86

$X^2 = 9.24^{**}$

*Expected frequencies are in parentheses
**Significant beyond the 1% level of confidence

TABLE 4.12

TWO-WAY CONTINGENCY TABLE FOR QUESTIONNAIRE OPINION SCORES AND OCCUPATIONAL PREFERENCE SHEET SCORES (N = 86)

Opinion Scores	Occupational Preference Sheet Scores		Totals
	Above Median	Below Median	
Above Median (3-8)	19 (24.00)*	29 (24.00)	48
Below Median (0-2)	24 (19.00)	14 (19.00)	38
Totals	43	43	86

$X^2 = 4.72^{**}$

*Expected frequencies are in parentheses
**Significant beyond the 5% level of confidence

Although responses to the ten stereotyped statements reflecting opinion toward women's work roles do not appear to be of use in differentiating between the four groups, the chi square test demonstrates that responses to the ten statements are not independent of scores on the Inventory of Beliefs and Occupational Preference Sheet. It can be inferred from this finding that scores on the ten statements are related in some way. It can be further inferred that an appropriate correlation technique might provide evidence of a significant relationship. Such a finding would be anticipated for the Inventory of Beliefs, which, like the ten statements, is comprised of stereotyped statements. On the other hand, there is less a priori evidence for anticipating that the tendency to accept of reject stereotyped statements about the proper work role of women might be related to a measure of the tendency to be traditional or non-traditional in occupational preference.

As with some of the other data requested on the questionnaire, the career pattern choices on the last page of the questionnaire did not serve to differentiate among the four curricular groups. Instead, about half of the women in each group chose a non-traditional career pattern and the other half chose a traditional career pattern, as shown in Table 3.7. However, when those choosing a traditional versus a non-traditional career pattern were separated into those who scored low, medium and high on the ten item opinion scale, as shown in Table 4.13, a chi square value significant at the one per cent level of confidence was obtained. An inspection of the contingency table in Table 4.13 shows that those women who most often reject stereotyped opinion statements (low scorers) tend to choose the non-traditional career pattern as most desirable, while those who most often accept the stereotyped statements (high scorers) tend to choose a

traditional career pattern. This finding is in agreement with the proposition that individuals who are most stereotyped in their beliefs will tend to be most traditional in their occupational outlook.

TABLE 4.13

TWO-WAY CONTINGENCY TABLE FOR QUESTIONNAIRE OPINION SCORES AND CAREER PATTERN CHOICES FOR THE SAMPLE AS A WHOLE (N = 86)

Opinion Scores	Career Pattern		Totals
	Traditional	Non-Traditional	
Low	4 (12.70)*	22 (13.30)	26
Medium	12 (18.07)	16 (18.93)	37
High	17 (11.23)	6 (11.77)	23
Totals	42	44	86
	$x^2 = 18.36$**		

*Values in parentheses are expected frequencies
**Significant beyond the 1% level of confidence

Summary

This chapter presented a detailed analysis of the data obtained through administration of the various instruments used in the study. Each major hypothesis was restated and accompanied by pertinent findings and a discussion of the findings. In addition, questionnaire data were analyzed and discussed. The findings of the hypotheses are summarized in Table 4.14.

TABLE 4.14

SUMMARY OF FINDINGS ON THE HYPOTHESES TESTED

Legend: *OPS-Occupational Preference Sheet,* IB-Inventory of Beliefs, PPS-Personal Preference Schedule

Hypotheses	Test Used	Value Obtained	Hypothesis Accepted or Rejected	Level of Confidence
Hypothesis 1: (Null) On the OPS there is no significant difference between mean scores of the four curricular groups.	F-test	3.80	Rejected	5%
Hypothesis 2: (Null) On the OPS there is no significant difference between the mean score of the combined non-traditional groups and the mean score of the combined traditional groups.	"t" test	2.67	Rejected	1%
(Alternate) The mean score of the combined traditional groups will be significantly lower.	"t" test	2.67	Accepted	5%
Hypothesis 3: (Null) On the IB there is no significant difference between mean scores of the four groups.	F-test	10.37	Rejected	1%
Hypothesis 4: (Null) On the IB there is no significant difference between the mean score of combined non-traditional and the mean score of combined traditional groups.	"t" test	1.79	Accepted	
(Alternate) The mean score of the combined traditional groups will be significantly lower.	"t" test	1.79	Accepted	

TABLE 4.14--Continued

Hypotheses	Test Used	Value Obtained	Hypothesis Accepted or Rejected	Level of Confidence
Hypothesis 5: (Null) There is no significant relationship between scores on the OPS and IB for the four groups, separately or collectively.				
1. Mathematics-chemistry	Pearson r	.04	Accepted	
2. Journalism-advertising	"	.24	"	
3. Medical technology	"	.08	"	
4. Home economics	"	-.49	Rejected	5%
5. The four groups combined	"	.05	Accepted	
(Alternate 5a) There will be a significant positive correlation between OPS and IB scores for the four groups combined.	Pearson r	.05	Accepted	
(Alternate 5b) There will be a significant positive correlation between OPS and IB scores in each of the four groups separately.	Pearson r	Same as 1-4 above	All four accepted	
Hypothesis 6: (Null) There is no significant difference between mean scores of the four curricular groups on the following manifest needs:				
1. Achievement	F-test	1.94	Accepted	
2. Dominance	"	.79	"	
3. Autonomy	"	.41	"	
4. Endurance	"	1.46	"	
5. Aggression	"	1.68	"	
6. Deference	"	1.13	"	
7. Abasement	"	.90	"	
8. Nurturance	"	.72	"	

Chapter V will contain the summary, conclusions and implications of the study.

CHAPTER V

SUMMARY, CONCLUSIONS AND IMPLICATIONS

Summary

The Problem

The purpose of the study was to investigate differences in occupational preferences, stereotypic thinking and needs among women undergraduates in selected curricular areas. Women were selected for study for several reasons. In the first place, there has been a limited amount of research and study devoted to the subject of women's vocational development. Secondly, the importance of such a study is underscored by the fact that one out of every three workers in the labor force of the United States is now a woman, and in the population as a whole, females outnumber males by approximately one million. In the third place, there has been in recent times a great deal of concern expressed over the changing role of women in our society, with much of the conflict centering around the role of women in work.

The basic theoretical proposition underlying the study is that vocational development is an aspect of personal development and, as such, constitutes an attempt on the part of an individual to implement his self concept. Consequently, it is felt that factors in personal development, such as stereotypic thinking, and factors in vocational development, such as occupational preference and choice of major, are interrelated.

Within the conceptual framework of the study, women's occupational preferences are considered to fall along a "traditional--non-traditional"

continuum. An instrument was developed to measure the degree to which women prefer traditional rather than non-traditional occupations and samples were selected from a university population in such a way that they represent varying degrees of this "traditionality" variable. It was proposed that there would be differences between curricular groups in the degree to which they were traditional (or non-traditional) in occupational preference.

Methodology and Procedure

The final sample consisted of eighty-six women students from four curricular areas: home economics, medical technology, journalism advertising, and mathematics-chemistry. They are listed in order from what is considered to be most traditional to least traditional. The latter two groups are combinations of related curricular areas due to the limited number of students available. The home economics group represents a stratified random sample of home economics majors, while the remaining three groups represent a 70-80% sampling of all the students in those curricular areas.

The instruments administered to the subjects were: (1) the Inventory of Beliefs--to measure stereotypic thinking, (2) the Edwards Personal Preference Schedule--to measure manifest needs, (3) an Occupational Preference Sheet--to measure women's preference for traditional as opposed to non-traditional occupations, and (4) a questionnaire specifically designed to obtain information concerning family background, career and marriage plans, and opinion about women's work role. The higher a person's score on the Inventory of Beliefs, the less stereotyped he is considered to be in his thinking. Similarly, the higher an individual scores on the Occupational Preference Sheet, the more non-traditional he

is considered to be. Using Hoyt's analysis of variance technique, a reliability estimate of .57 was obtained for the Occupational Preference Sheet in the final study. This was considered acceptable for the purpose of the study, which is exploratory in nature.

Results

1. It was hypothesized that there would be no significant difference between mean scores of the four curricular groups on the Occupational Preference Sheet. The prediction was made in an alternate hypothesis that the order of mean scores from highest to lowest would be mathematics-chemistry, journalism-advertising, medical technology and home economics, respectively. Using analysis of variance technique for simple randomized designs, the null hypothesis was rejected at the 5% level of confidence. Although all the means were in the predicted order of magnitude, the alternate hypothesis, tested by Tukey's technique, was accepted only for the mathematics-chemistry and home economics groups. Tukey's procedure showed that there was a "significant gap" between the mean score of the mathematics-chemistry group and home economics group, and also a "significant gap" between each of the latter two means and the collective means of the remaining two groups--medical technology and journalism-advertising.

2. An analysis of the difference betwen the mean Occupational Preference Sheet score of the combined home economics and medical technology groups, and the mean score of the combined mathematics-chemistry and journalism-advertising groups, using the "t" test, resulted in rejection of the null hypothesis at the 1% level of confidence. The prediction made in the alternate hypothesis, that the mean score

of the combined home economics and medical technology groups, representing "traditional" women's occupations, would be significantly lower than the mean score of the two less traditional groups--mathematics-chemistry and journalism-advertising, was accepted at the 5% level.

3. It was hypothesized that there would be no significant difference between mean scores of the four curricular groups on the Inventory of Beliefs. Using analysis of variance technique, the null hypothesis was rejected at the 1% level of confidence. It was predicted in the alternate hypothesis that the order from the highest to lowest mean would be mathematics-chemistry, journalism-advertising, medical technology, and home economics, respectively. The means were in the predicted order, except for the fact that the means of the home economics and medical technology groups were in reverse order. Using Tukey's procedure, a "significant gap" was found between the mathematics-chemistry group mean score and the mean scores of the remaining three groups. No significant differences were found among the latter three means when Tukey's tests for a "straggler" and for "excessive variability" were applied.

4. A "t" test of the difference between the mean Inventory of Beliefs score of the combined mathematics-chemistry and journalism-advertising group and the mean score of the home economics and medical technology groups resulted in acceptance of the null hypothesis. The alternate hypothesis predicted that on the Inventory of Beliefs the mean score of the "traditional" medical technology and home economics groups would be significantly smaller than the mean score of the less traditional mathematics-chemistry and journalism-advertising groups. The alternate hypothesis was accepted.

5. The hypothesis that there is no significant relationship

between scores on the Occupational Preference Sheet and Inventory of Beliefs was accepted for the groups, separately and collectively, with the exception of the home economics group. In the latter case, a significant negative correlation resulted in rejection of the null hypothesis, at the 5% level of confidence. The alternate hypothesis which predicted a significant positive correlation between scores on the same two instruments, was accepted for (1) the four groups separately, and (2) the combined groups. A slight positive correlation of .05 was found between overall scores of the groups on the Occupational Preference Sheet and the Inventory of Beliefs.

6. An analysis of variance model was employed to test for a significant difference between means of the four curricular groups on the following manifest needs measured by the Edwards Personal Preference Schedule: (1) achievement, (2) dominance, (3) autonomy, (4) endurance, (5) aggression, (6) deference, (7) abasement, and (8) nurturance. The null hypothesis was accepted in each case. It was predicted in an alternate hypothesis that the mathematics-chemistry group would have the highest mean score and that there would be progressively smaller means in the journalism-advertising, medical technology and home economics groups, respectively, on the manifest needs: achievement, dominance, autonomy, endurance and aggression. The second alternate hypothesis was that the home economics group would have the highest mean on deference, abasement and nurturance, and that the mean score of the medical technology, journalism-advertising and mathematics-chemistry groups would be progressively smaller. The alternate hypotheses were not tested because of the finding of no significant difference, using the F-test.

Conclusions

1. College women in the four curricular groups differ significantly in the extent to which they prefer "traditional" as opposed to "non-traditional" occupations. Those in mathematics-chemistry prefer less traditional occupations over traditional ones, while those in home economics prefer traditional over less traditional occupations. Women in the journalism-advertising and the medical technology groups occupy an intermediate position and are more similar to each other in occupational preference than they are similar to the remaining two groups.

2. The two groups representing less traditional women's occupational areas, mathematics-chemistry and journalism-advertising, differ from the two traditional groups, home economics and medical technology, in the extent to which they prefer traditional over less traditional occupations. Students in the less traditional groups exhibited a preference for less traditional occupations, while those in the traditional groups tended to prefer traditional occupations.

3. College women in the four curricular groups studied differ significantly in the extent to which they are stereotyped in their beliefs. Those in the mathematics-chemistry group are least stereotypic; those in medical technology, most stereotypic. Women in journalism-advertising and home economics occupy an intermediate position with essentially no difference between them in the extent to which they are stereotyped.

4. There is a slight but not statistically significant tendency for women in the combined mathematics-chemistry and journalism-advertising groups to be less stereotyped in their beliefs than the combined home economics and medical technology groups.

5. Among the four curricular groups, combined into a single group, there is close to a zero-order correlation between scores on the Inventory of Beliefs and scores on the Occupational Preference Sheet.

6. Among the four curricular groups studied there are no significant differences in the following manifest needs: achievement, autonomy, dominance, endurance, aggression, deference, abasement and nurturance.

7. Differences in (1) the amount of education completed by parents, (2) work history of the mother, (3) opinion concerning the proper role of women, and (4) career pattern preference are so slight as to be little value in differentiating between the four curricular groups, separately.

8. Scores reflecting acceptance (and rejection) of stereotyped statements concerning the proper role of women in work are <u>not</u> independent of scores on (1) the Inventory of Beliefs, and (2) Occupational Preference Sheet, suggesting possible significant correlations.

9. Those women who are most accepting of stereotyped statements concerning the proper role of women express a preference for following a traditional career pattern, and those who are least accepting of the same statements tend to prefer a less traditional career pattern.

Implications

As anticipated, this study did not furnish a neat and unequivocal pattern of relationships and differences among the variables studied. Evidence concerning the nature of women's vocational development is at best, indirect, and in many respects inconclusive. Nevertheless, there is sufficient evidence on the positive side to suggest trends and to

indicate the relevance of the findings to existing theory and research.

To begin with, the fact that there were significant differences between curricular groups in the extent to which they are traditional or non-traditional in occupational preference suggests that sociological and cultural factors have impact upon the vocational development of women. This conclusion follows logically from the fact that the "traditional--non-traditional" concept evolved from a consideration of differences between men's and women's roles in our society. It will be recalled also that the designation of occupations as "traditional," "less-traditional" and "non-traditional" by definition takes into account cultural expectations for men and women, as well as actual differences in their work roles as reflected in Census figures.

Results of the study suggest that the use of a "traditional--non-traditional" concept may have important application to women's vocational theory. The effectiveness with which certain predictions were made in the present study demonstrates (1) the usefulness of this concept, and (2) the utility of an instrument, the Occupational Preference Sheet, derived from the same theoretical framework. The evidence of construct validity of the Occupational Preference Sheet lends support to its appropriateness. Although this concept has been used only in a college setting with limited numbers, it is believed to be applicable to other situations and other aspects of women's vocational development.

The relationship between stereotypic thinking and vocational development was investigated. Here the findings are somewhat difficult to interpret. On the one hand, significant differences in stereotypy were found between curricular groups in a direction generally consistent with the theoretical framework, suggesting that the degree to which a

person is stereotyped in his thinking may be related to his choice of major and ultimate vocational selection. That is, students in less traditional curricular areas tended to be least stereotyped in their beliefs, those in traditional areas--most stereotyped. There was a similar tendency for students in less traditional areas to be least traditional in their occupational preferences and for those in traditional curricular areas to prefer traditional women's occupations. On the other hand, very little relationship was found between scores on the measure of occupational preference and scores on the measure of stereotypic thinking. Admittedly, the correlation technique is a less sensitive statistical tool than the analysis of variance model used to study the differences among groups.

The obvious fact remains that the Inventory of Beliefs and the Occupational Preference Sheet are only slightly correlated and yet seem to distinguish between curricular groups in a manner which suggests they may be measuring related phenomena. The implications of this set of conditions are highly speculative. It is evident that a direct relationship between two instruments cannot be inferred solely on the basis of such evidence. One implication which is fairly self-evident is that the two instruments involved in the study are not interchangeable. That is, results obtained on the one cannot be generalized to the other.

The finding of no significant relationship between needs and choice of major gives little information concerning the role of needs in choice of major field of study. As previously stated, the rejection of the null hypothesis in a study does not necessarily mean that no differences exist. It signifies only that no differences were found. It is believed that an approach different from the one used in this study may be needed to furnish

evidence of differences on need variables. The failure to find predicted differences on the Personal Preference Schedule underscores the experimental nature of the instrument. It suggests that caution should be used in attempting to use the instrument for individual prediction and vocational counseling.

The possibility that some of the findings in the study may be confounded by intellectual factors cannot be discounted. There is the finding of an overall positive correlation between scores on two main instruments used in the study, the Inventory of Beliefs and the Occupational Preference Sheet, and scores on the American Council of Education Psychological Examination. Similarly, there is the somewhat disconcerting fact that the group showing the most significant differences on the variables studied is the group which is significantly higher in intellectual ability--the mathematics-chemistry group. Although the exact nature of the effect of intellectual ability on the overall results is not readily apparent, there is evidence to suggest that the possible effect of this factor cannot be overlooked.

Great caution should be exercised in attempting to generalize from the findings in the home economics group. As previously indicated, the effect of stratification of this group on intellectual ability imposes a serious limitation. The attempt to equate this group with other groups in terms of intellectual ability raises a question as to the representativeness of the sample. As a result one can conclude only that the results may be applicable to other groups of home economics majors who have been selected on a similar basis, and one must entertain the possibility that the home economics group in this study differs significantly on the variables studied from home economics majors selected at random or on some other basis.

Suggestions for Further Research

The Occupational Preference Sheet and the theoretical approach used in this study appear to offer fruitful materials for the further study of women's

vocational development. For example, a chronological or cross-sectional study might be conducted of the vocational development of women at varying age or grade levels, such as beginning high school, senior high school, college freshmen, and college graduate level, using the same variables or some adaptations. This could be expected to demonstrate differences at different levels and also to provide information concerning the sequential or developmental nature of these facets of vocational development. Such a study would undoubtedly uncover differences not apparent or visible in a group as homogeneous as was the present one in certain respects.

A study might be conducted to investigate differences in the extent to which women are traditional or non-traditional in their outlook in different social strata and at different occupational levels.

It is suspected that the phenomena of identification may play an important part in the concept of a traditional, in contrast to a non-traditional, orientation, and in other aspects of the vocational development of women. Therefore, an investigation of the relationship between identification and selected aspects of vocational development would be appropriate.

In the present study the criteria used for placing occupations into the categories of "traditional," "less-traditional" and "non-traditional" were arrived at by soliciting "expert" opinions and by reference to sources external to the subjects themselves. It would be interesting to utilize the perceptions of the women concerned, or of other college women, to arrive at these definitions. This would make it possible not only to relate their own perceptions to specific aspects of vocational development, but would also make it possible to compare their perceptions with those of others, such as college men, significant others, and faculty.

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APPENDIX A

OCCUPATIONAL PREFERENCE SHEET

Occupational Preference Sheet

On the attached sheet are listed various occupations in groups of three.

For the purpose of completing this form, please assume you are perfectly free in making a choice. Then select the occupation you would like most to engage in and the one you would like least in each group of three.

You are also asked to assume that you have the qualifications necessary to fill any of the occupations listed. Make your selection on the basis of whether or not you think you would enjoy doing the type of work involved in the occupations chosen.

Make an X in the LIKE MOST column opposite the occupation you prefer in each group. Similarly, mark the one you prefer least under the LIKE LEAST column. Make no mark opposite the remaining occupation in each group, i.e. you check only two of the three in each group.

		LIKE MOST	LIKE LEAST
Example:	Stewardess	___	___
	Florist	x	___
	Entertainer.....	___	x

Please do not skip any items even though some may seem equally interesting or uninteresting, thus making a choice difficult. Avoid spending a great deal of time on any one item or group of items. Your first impression is preferred.

There are no right or wrong answers. Answer according to what you think is right for you.

	LIKE MOST	LIKE LEAST
Accountant	____	____
Private Secretary	____	____
Dress Designer	____	____
Interior Decorator	____	____
Advertising Agent	____	____
Interpeter	____	____
Model	____	____
Dietitian	____	____
Photographer	____	____
Mathematician	____	____
Elementary School Teacher	____	____
Musician	____	____
Medical Technician	____	____
Physical Therapist	____	____
Insurance Agent	____	____
Nurse	____	____
Scientific Research Worker	____	____
Speech Correctionist	____	____
Artist	____	____
Social Worker	____	____
Dentist	____	____
High School Teacher	____	____
Magazine Writer	____	____
Lawyer	____	____
Department Store Buyer	____	____
Pharmacist	____	____
Actress (stage)	____	____
Newspaper Reporter	____	____
Librarian	____	____
Architect	____	____
Personnel Manager	____	____
Occupational Therapist	____	____
Dance Instructor (Ballet)	____	____
Home Economics Teacher	____	____
Author of popular novels	____	____
Horticulturist	____	____
Y.W.C.A. Official	____	____
Commercial Artist	____	____
Script Writer	____	____
Travel Consultant	____	____
Employment Interviewer	____	____
Dental Hygenist	____	____
Specialty Salesman	____	____
Stage Designer	____	____
Bank Teller	____	____
Advertising Writer	____	____
Hotel Manager	____	____
Statistician	____	____
Social Worker	____	____
Columnist	____	____
Personnel Manager	____	____
Physical Education Teacher	____	____
Social Science Teacher	____	____
Physical Science Teacher	____	____
Stockbroker	____	____
Marriage Counselor	____	____
T.V. Entertainer	____	____

APPENDIX B

QUESTIONNAIRE USED IN THE STUDY

To the Student:

The information requested on the attached questionnaire is of a somewhat personal nature. This information is vital to the study being undertaken because it will make possible the relating of subsequent test data to a person's actual plans. In addition, it will provide a basis for making comparisons between individuals and for making generalizations about the results.

All data collected is strictly confidential and will be used for research purposes only. No names will be used.

To insure complete anonymity you are asked not to place your name on any of the forms. The number printed on each form will be sufficient identification for research purposes.

Note: Please complete the questionnaire and the remaining forms in the order in which they are given to you, i.e. the top one first and the bottom one last.

Questionnaire

1. Your present major _____

2. Class (please circle one) Freshman Sophomore Junior Senior

3. Are you married? (circle one) Yes No

4. Family background:

   a. Father

      (1) What is his occupation? _____

      (2) His education (check highest level completed)
      Grade School _____
      High School _____
      College (4 yrs) _____
      More than 4 yrs college _____

   b. Mother

      (1) Education (check highest level completed)
      Grade School _____
      High School _____
      College (4 yrs) _____
      More than 4 yrs college _____

      (2) Does she work outside the home? Yes No

      If yes, what does she do? _____

      Part-time? _____
      Full-time? _____

      (3) Has she ever worked outside the home previous to this?
      Yes No

      If yes, what did she do? _____

      (4) If your mother is working or has worked since marriage, indicate what you think are the primary reasons for her doing so.

      _____
      _____
      _____

5. Your plans

   a. Do you expect to marry? (if not already married) Yes No

      Before graduation? Yes No
      Within 1 year of graduation? Yes No
      Within 5 years of graduation? Yes No

   b. Do you plan to work outside the home after marriage? Yes No

      Full-time? Yes No
      Part-time? Yes No

6. Please indicate your agreement or disagreement with the following statements. Circle the number (1, 2, 3 or 4) which most accurately reflects your opinion regarding the statements.

Circle 1 if you strongly agree with the statement
Circle 2 if you agree with the statement
Circle 3 if you disagree with the statement
Circle 4 if you strongly disagree with the statement

a.	The old saying that "marriage and careers don't mix" is as true today as it ever was.	1	2	3	4
b.	A husband is justified in resenting his wife's wanting to work outside the home if there is no economic necessity.	1	2	3	4
c.	The main reason why more women do not engage in men's occupations is that they are not temperamentally suited for the work.	1	2	3	4
d.	It is only right that men receive higher wages than women for comparable work, since men usually have families to support.	1	2	3	4
e.	Women have no business entering men's occupations any more than men have a right to take over women's jobs.	1	2	3	4
f.	If there are children in the family a wife should work outside the home only in case of real economic necessity.	1	2	3	4
g.	The fact that a woman derives satisfaction from a career outside of homemaking is not sufficient justification for her engaging in it.	1	2	3	4
h.	It is difficult for a woman to be truly "feminine" if she insists on being a career woman.	1	2	3	4
i.	Men are justified in opposing the entrance of women into traditionally men's occupations, such as science and engineering.	1	2	3	4
j.	It is quite obviously true that a major share of juvenile delinquency in this country results from married women, with families, working outside the home.	1	2	3	4

Although it is difficult to know what you will be doing at some future time in terms of career plans and marriage, you have probably considered various possibilities such as those listed below. From amongst these, please check the one you feel fits most closely into the pattern you would like to follow.

Check one only

_____ 1. I would like to marry while in college or shortly after graduation and become a full-time homemaker with no further career ambitions or work plans.

_____ 2. I would like to work for a period following graduation. After a relatively brief work experience of a few months to (possibly) a few years, I would expect to marry and become a full-time homemaker with no further career ambitions or work plans.

_____ 3. After graduation I would like to embark on a career which will become my life's work. If I marry, I would interrupt my career plans long enough to raise a family. In any event, I would expect to resume a career after a period of full-time homemaking.

_____ 4. After graduation I would like to embark on a career. I expect to marry but also expect to continue with a double career, i.e. working and homemaking. The only time I would be away from my work would be during periods of child-bearing.