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Predicting the career choice of elementary and secondary teaching among college women

McDonald, Melinda L., Ph.D.
The Ohio State University, 1991
PREDICTING THE CAREER CHOICE OF ELEMENTARY AND SECONDARY TEACHING AMONG COLLEGE WOMEN

DISSERTATION

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

By

Melinda L. McDonald, B.A., M.A.

* * * * *

The Ohio State University

1991

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I would like to express my appreciation to my advisor, Susan Sears, for her support and guidance throughout the dissertation process. Sincere thanks go to George Steele, Gary Kennedy and Wendall Gardner who provided statistical and computer assistance. I would also like to acknowledge my appreciation to my husband, Gary Alexander, who gave me the encouragement and support needed to complete the writing of the dissertation. Last, I would like to express my appreciation to my parents who taught me to value learning and provided opportunities for me to pursue graduate level education.
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Chapter I

Introduction

Rationale for the Study

The origins of vocational psychology in the United States can be traced to Frank Parsons, who first used a matching model in assigning appropriate jobs to military personnel during World War I. Since that time, a number of career development theories have been proposed by prominent career theorists (e.g., Anne Roe, John Holland, Donald Super, the Ginzberg group) to explain the process of occupational choice. Although these theories emphasize different aspects of the individual in relation to the choice process, they are based on the experiences of men and do not adequately take into account the nature of women's participation in the labor force or the unique and complex life patterns of women.
During the last fifty years women's participation in the labor force has increased significantly. In 1940, 27.4% of women in the United States worked. By 1989, the percentage of women between the ages of 18 and 64 who were in the civilian labor force had grown to 69%. Currently, almost 45% of the labor force is comprised of women (U.S. Bureau of Labor Statistics, 1988). While this data includes both African American and white women, it is important to point out that (in contrast to white women) African American women have worked "outside the home" since their coming to the United States (Jackson, 1990). In addition, there has been a large increase in the number of employed women with children. According to the U.S. Department of Labor Women's Bureau (1989), close to 65% of mothers with children under the age of 18 work while 52% of women with children at pre-school age work. Although the number of women participating in the labor force is almost equivalent to the number of men working, the nature of women's participation in the labor force continues to be different than that of men. Employment for women is often defined by jobs that keep women economically disadvantaged, lower in status and burdened with multiple roles (Betz & Fitzgerald, 1987). For African American women these disadvantages are even greater due to what Williams (1987) refers to as the "triple burden of differential treatment" that includes class, sex and race.
Despite a long history of women fighting for equal pay for equal work, a wage gap exists. In 1989, the average woman earned 70 cents for every dollar earned by the average man (U.S. Department of Labor Women's Bureau, 1990). This contributes to the fact that the majority of individuals at poverty levels are women. Over 50% of working women earn under $10,000 a year. Not only is there a disparity between wages earned by women versus those earned by men, there is also a major difference in the types of occupations women and men choose. Women continue to be concentrated in occupations that offer low pay, low status and little opportunity for advancement (Betz & Fitzgerald, 1987). As recently as 1989, women comprised 80% of all administrative support (including clerical) workers and 68% of all retail and personal service sales workers (U.S. Department of Labor, 1990). A similar pattern exists at the professional level where women are employed in occupations that offer low salaries and little prestige (i.e., nursing, teaching, social work and library science). On the other hand, men are found in those professions that are more prestigious and offer higher salaries (i.e., medicine, law, engineering and science).

Another characteristic that distinguishes women's participation in the labor force from that of men's is that women tend to underutilize their abilities (Betz &
Fitzgerald, 1987). Studies indicate that women continue to choose traditional female occupations (i.e., secretary, teacher, nurse) regardless of I.Q. (Terman & Oden, 1959) or academic aptitude (Card, Steel & Abeles, 1980). Women are also faced with role overload as they struggle to manage worker, wife and mother roles. Studies (i.e., Atkins & Huston, 1984) reveal that married women continue to do the majority of the household tasks while holding down full-time jobs.

Career development theories, based on studies of men, do not take into consideration the circumstances of women's participation in the labor force. Similarly, these theories neglect the unique aspects of women's socialization and life patterns. Developmental models, such as the one proposed by Super (1964), do not include plans for marriage and childbearing which result in women's developmental stages differing from those of men (Osipow, 1975). An important aspect of Super's model is the implementation of self-concept through the choice of an occupation. According to Osipow (1975), this process may cause conflict for women who perceive a role split between mother-wife-worker. Similarly, Chodorov (1978), Gilligan (1982), Josselson (1987) and Lyons (1983) believe that the process of female and male identity formation occurs in different ways, subsequently impacting
socialization and resulting in different experiences and choices for men and women. Difficulties with matching models of career development have also been pointed out by Osipow (1975) who contends that the socialization process prevents women from making occupational choices freely and equitably.

The need for separate career development theories for men and women is evident. Differences exist in men's and women's participation in the labor force, socialization, and perceptions of combining work, marriage and childrearing, which prevent both men and women from making equitable career choices, based on a full range of occupational opportunities.

The first studies (i.e., Hoyt & Kennedy, 1958) that examined the career development of women focused on the phenomenon of the working woman and why women chose to work. Career-oriented women were compared to those who were homemaking-oriented (Hoyt & Kennedy, 1958). However, as more and more women entered the labor force, broke away from traditional roles, and combined career and marriage, the distinction between these two groups became less applicable. Studies (Astin & Myint, 1971; Nagely, 1971; Standley & Soule, 1974; Tangri, 1972) conducted in the early 1970's categorized women according to the nature and
degree of career orientation. A traditional orientation referred to women choosing occupations in which women dominated versus a non-traditional orientation which referred to women choosing occupations in which men dominated. Career patterns (typically based on vocational participation) were also utilized to describe women's career behavior (Betz, 1984; Super, 1957; Wolfson, 1976; Zytowski, 1969).

The most popular approach to studying women's career development has been through the use of individual variables to predict women's occupational choice. Ability and academic achievement (Card, Steel & Abeles, 1980; Hyde, 1981, 1985; Terman & Oden, 1959) as well as mathematics orientation (Benbow & Stanley, 1980; Chipman & Thomas, 1985; Ethington & Wolfe, 1988; Fennema, 1980; Sells, 1973) have consistently been found to influence both occupational choice and career orientation. The literature also indicates that self-esteem (Antill & Cunningham, 1979; Stake, 1979) and instrumental personality characteristics (Lemkau, 1979, 1983; Spence & Helmreich, 1978; Tangri, 1972; Wong, Kettlewell & Sproule, 1985) are important variables that impact women's occupational choice. Perhaps the most influential variables related to women's career development are those associated with marriage and family status (Gigy, 1980;
Despite the amount of research that has been conducted in this area in the last twenty years, there is not yet a satisfactory career development theory that explains women's vocational behavior (Betz & Fitzgerald, 1987). Recently, there have been several innovative attempts to integrate variables and provide a multidimensional approach to women's career development (Astin, 1984; Farmer, 1985; Betz & Fitzgerald, 1987, as tested by Fassinger, 1985, 1990). Fassinger (1985, 1990) in particular, has significantly added to the knowledge of women's career development theory by offering a comprehensive model that allows for the examination of causal relationships between variables.

In an attempt to expand women's range of career choices, there has been a number of studies that focus specifically on women's non-traditional choices (particularly those in the sciences, mathematics and engineering) (i.e., Fox, Brody, & Tobin, 1980; Pfafflin, 1984). However, current research examining the traditional career choices of women has been neglected. Although the number of women entering certain fields once considered male-dominated (i.e.,
accounting, pharmacology, computer science, banking and financial management) has increased, the majority of women at all levels of employment continue to choose traditional occupations, even when ability and other variables indicate higher paying and more prestigious options. In order to assist women and men in making career choices freely and equitably, based on abilities, interests and values, there is a need for understanding what variables predict traditional occupational choice among women.

To date multivariate research on women's career development has (most often) been conducted utilizing samples of women in high school (i.e., Farmer, 1985) or college (i.e., Fassinger, 1985, 1990). These samples consist of women interested in a variety of college majors and occupations. In Fassinger's (1990) study utilizing two samples of college women, problems with the Career Choice variables were indicated in all three models. Difficulties were particularly evident in the Ohio State sample due to a large number of women planning science-related careers in traditionally female fields (i.e., nursing and dental hygiene). Fassinger (1990) states, "This pattern interferes with the predictive capacity of the model since it tends to cancel out covariances involving the science-relatedness variable..." (p. 245). She (1990) goes on to suggest that "... one solution to
this problem would be to group subjects according to a priori science-relatedness categories of occupational choice, and then test causal sequences among the other variables" (p. 245). Therefore, it may be advantageous to study the career development of women utilizing a sample of women who express an interest in one occupational field. This approach would allow for a clearer pattern of relationships among variables and would result in increased knowledge about the career development of women choosing a particular occupation. It would also lend support to the idea that there may not be one comprehensive model of career development that can be applied to all women. Instead, different career development models for women may exist based on the different occupational areas that they are choosing.

Problem Statement

Theory advancement in the understanding of women's career development is essential in resolving the problematic aspects of women's career choices and in promoting gender equality in career opportunities. Women's career choices must be made more freely, limiting the restraints of socialization, and must be made within the context of a broad range of viable options.
The purpose of this study is to add to the knowledge base of women's career development through providing a better understanding of the variables that predict career choice of education among college women. In order to achieve this purpose, a multivariate approach is utilized to test the importance of several salient predictor variables. More specifically, variables measuring academic achievement, mathematics ability, sex-role orientation, self-esteem, career orientation and the importance of career versus family are examined to determine which variables predict the career choice of elementary and secondary teaching among college women.

Research Question

The study will address the following research question:

Which variables predict career choice of elementary and secondary education among college women?

Significance of the Study

First and most important, this study contributes to the theoretical advancement in the understanding of the career development of women. Approaches to the study of women's career behavior have changed and advanced over the last twenty-five years to keep pace with changes in societal
attitudes and norms and the increasing numbers of women entering the work force. Based on these changes and the current status of women's participation in the labor force, Betz and Fitzgerald (1987) have outlined several goals for women's career choices. "Women's career choices, then, should utilize rather than waste women's abilities and talents, and should represent the full-range of occupational possibilities rather than the restricted range of female-dominated professions and 'pink-collar' jobs" (Betz & Fitzgerald, 1987, p. 250). Further research that provides insight into women's career choices and explains how and to what degree sociological and individual variables impact these choices is important in reaching these goals and in keeping up with societal changes.

Second, this study contributes to the practical implications for the career counseling of women. Career counselors play an essential role in adhering to and carrying out the goals for women's career choice proposed by Betz and Fitzgerald (1987). Individuals working with women have an important responsibility to confront women expressing socialized stereotypes and beliefs, to encourage continuation in mathematics and to provide support and encouragement for the development of non-traditional interests and abilities. Further research on
the career development of women will expand the knowledge base in the field and provide current data for practitioners.

Third, due to the composition of the sample utilized in the study, information is provided about the career choice of elementary and secondary teaching. There is growing concern among today's educators that both the supply and the qualifications of future teachers are on the decline. It is estimated that if the current supply of elementary and secondary teachers remain constant, only 63% of the openings will be filled by 1993 (Carnegie Foundation for the Advancement of Teaching, 1987). The question of teacher competency is equally important. Research indicates that high school seniors planning to major in education have lower SAT scores than those selecting other fields of study (Savage, 1983). According to Change Trendlines (1986), one of the most essential tasks confronting educators is finding better ways to define who will make a good teacher and then measure more carefully the quality of those who enter the profession. Before these tasks can be accomplished, current data is needed on the types of individuals who are attracted to the teaching profession. This study adds to the knowledge needed to achieve this initial step.
Definition of Terms

The following terms will be used throughout the study.

1) **Ability** - A measure of the extent to which a person is capable of performing a certain task (Sattler, 1982).

2) **Achievement** - A measure of formal mastery of factual information (Sattler, 1982).

3) **Agentic (Personality Characteristics)** - A term used to describe the capabilities of self-assertion and motivated to master (Bakan, 1966).

4) **Androgynous** - An individual who is capable of displaying a balance of masculine and feminine characteristics (Bem, 1974). For example, an androgynous individual is able to utilize "masculine" behaviors (e.g., assertiveness, active problem solving) and "feminine" behaviors (e.g., giving emotional support to others) depending upon the situational demands (Betz & Fitzgerald, 1987).

5) **Career** - The chronological sequence of an individual's work-related activities (Isaacson, 1986).

6) **Career Choice** - The process of selecting a particular type of work to pursue.

7) **Career Counseling** - The process of assisting clients through an individual or small group mode to integrate self assessment and environmental information in making career decisions and adjustments (Sears, 1982).
8) **Career Development** - The interaction of psychological, sociological, educational, physical, economic, and chance factors that combine to form the career or series of occupations, jobs and positions that individuals hold over the life span (Sears, 1982).

9) **Career Development Theories** - Theoretical bases for explaining how individuals develop vocationally (Sears, 1982).

10) *Expressive (Personality Characteristics)* - A term used to describe the characteristics of traditional femininity (i.e., nurturance, interpersonal concern and emotional expressiveness and sensitivity).

11) **Freshman Early Experience Program (FEED)** - A course in the Department of Educational Services and Research designed to provide an exploratory experience for students interested in pursuing education majors at The Ohio State University.

12) *Feminine (Personality Characteristics)* - A term used to describe a set of characteristics typically associated with females (i.e., emotional, sensitive, nurturant, considerate, sympathetic, warm and intuitive) (Cook, 1985).

13) **Intelligence (I.Q.)** - A measure of an individual's general intellectual functioning that usually includes the ability to deal with abstractions, the ability to learn and the ability to cope with new or novel
14) **Interest** - A term that describes what an individual likes to do and/or considers satisfying (Sears, 1982).

15) **Masculine (Personality Characteristics)** - A term used to describe a set of characteristics frequently associated with males that include aggressive, independent, dominant, competitive, analytical, acts as a leader and self-confident (Cook, 1985).

16) **Non-traditional Occupations** - Those occupations in which the participation of one sex is less than 25%; those occupations that have traditionally been held by members of one sex. Examples of non-traditional occupations for women include engineer, architect and doctor (Gibson & Fast, 1986).

17) **Occupational Stereotyping** - A belief that some occupations are more suited for one sex than for the other (Betz & Fitzgerald, 1987).

18) **Sex-role stereotyping** - A set of beliefs that define "appropriate" sex-role behavior by gender (Hyde & Rosenberg, 1980).

19) **Traditional Occupations** - Those occupations in which the participation of one sex is more than 25%. Examples of traditional occupations for women include nurse, elementary school teacher and librarian (Gibson & Fast, 1986).
20) **Work Values** - Preferences for the "intrinsic" and "extrinsic" rewards, payoffs or outcomes of a particular job or career (Betz & Fitzgerald, 1987).

*Gilbert (1985) and Spence and Helmreich (1980, 1981) propose that researchers move away from utilizing the terms "masculinity" and "femininity" in order not to confuse sex-role identity with personality traits. Instead of "masculinity" and "femininity", labels such as "instrumental" and "expressive" are suggested as more descriptive of the actual behaviors and characteristics represented by their underlying content. Wherever possible, this study will avoid the terms "masculinity" and "femininity" and instead will use the terms "instrumental" and "expressive".

**Limitations**

Limitations that affect the conclusions of this study include the following:

1) The study utilized a sample of women interested in becoming teachers from one university setting. Therefore, the findings of the research cannot be generalized beyond the university from which the sample was selected and cannot be generalized beyond the specific occupational group from which the sample was selected.
2) Seminar leaders for the FEEP classes were five graduate students at the masters and doctoral levels enrolled in the Counselor Education program at The Ohio State University. Written instructions for the administration of the instruments and inventories were prepared and given to seminar leaders by the researcher prior to the distribution and administration of the inventories. Verbal instructions for the completion of the instruments and inventories were given to subjects by each seminar leader. Differences in seminar leaders' presentation of this information, in terms of general manner and behavior, may have influenced subjects' test-taking and motivation to follow instructions fully and conscientiously.

3) All of the instruments and inventories included in the study were completed outside of the classroom which eliminated control over testing conditions. Accurate and unbiased responses to the instruments and inventories depended upon the respondent's ability to read and understand the directions stated in the instruments.

4) Similarly, accurate and unbiased responses to the instruments and inventories depended upon the respondent's ability to read and understand the vocabulary contained in the instruments.
5) Student responses may indicate social desirability or an attempt to answer questions in order to "look good" for the College of Education. Although students were told by seminar leaders that their responses would remain confidential and would not be used for evaluation purposes, response sets may be identified in test responses due to the selective nature of the College of Education.

**Summary**

While there have been advances in the research on the career development of women in the last twenty-five years, societal changes and women's complex life patterns point to the need for continued study. More women today are participating in the labor force than at any other time in recent history. However, the occupations held by women continue to be those that offer low pay and low status, with little opportunity for advancement. Further research on the career development of women is essential to improving women's participation in the labor force and establishing career choice equity for women and men. Different from previous multivariate research on the career choice of women, this study will utilize a sample of women expressing an interest in one occupational field
(education). The salient factors that predict women's career choice will be identified.
Chapter II

Review of the Literature

Although the field of vocational psychology has a long history dating back almost eighty years, the inclusion of female subjects in career development research is a recent phenomenon. Until the early 1970's, knowledge of individuals' career choice and career development was based on a male model. In response to this void in the literature, there has been considerable emphasis on women's career development during the last twenty years. Numerous studies have been conducted providing both theoretical and practical knowledge of women's vocational choice. The first three sections of this review of the literature on women's career development will include the history of women's participation in the labor force, the major career development theories as they relate to women's vocational behavior, and the sociocultural and individual variables that impact women's career development. In the final section, literature on the career choice of teaching will be reviewed.
Women's Participation in the Labor Force

Women working outside of the home is not a recent occurrence. Prior to the industrial revolution, women in Western societies were employed in agricultural production and local craft businesses. Often children accompanied their mothers to the fields or family-owned shops. Women were relied on to provide agricultural labor as well as to perform domestic and child-care tasks. In the pre-industrial west, women's participation in the labor force was both possible and necessary due to the location of the home and worksite and the fact that a family's subsistence was dependent upon what was produced by the family itself. Gibson and Fast (1986) state, "A rigid distinction was not drawn between family and economic life; rather, the two spheres were integrated" (p. 52). However, the industrial revolution brought dramatic changes to the nature of work and the relationship between work and family. With the establishment of factories, women were not able to participate in economic activity and supervise children. As a result, women began to stay at home to supervise children and men provided the economic support for the family. Gibson and Fast (1986) contend that as factories replaced home-based production activities the productive
role of women began to erode. Women were forced to make a choice between tending their children and participating in the labor force to help support their families. At that time the societal norm was explicit. Women's primary responsibility was to care for their children. Despite such societal decrees and the fact that many women needed to work to survive, 1850 census figures indicate that over 250,000 women worked in factories alone. By 1900, approximately 20% of women 14 years and older were employed (Gibson & Fast, 1986).

Over the past fifty years women's participation in the labor force has increased dramatically. As a result of World War II women entered the labor force in order to fill jobs vacated by servicemen. In 1940, 27.4% of women in the United States worked and by 1950, about 34% of all women ages 16 to 64 were in the labor force. Labor-saving devices, new technology and mandatory public education changed the role of the homemaker allowing for less time in the home performing domestic and child-care activities. Since World War II the number of married, middle class women in the labor force has grown significantly. Single and poor women are no longer the only women working. Currently (1989), 69% of women between the ages of 18 and 64 are in the civilian labor force. Women constitute 45% of the labor force (U.S. Bureau of Labor Statistics,
1988). Not only are more women working, but more women with children are also employed. "Nearly 2 out of every 3 mothers with children under age 18 were in the labor force in March 1988. In 1977 less than half of all children under age 18 had mothers who were employed or seeking employment" (U.S. Department of Labor Women's Bureau, 1989, p. 2). Approximately 65% of women with children under the age of 18 are working while 52% of women with children at pre-school age work. While it is clear that the extent of women's participation in the labor force is approaching that of men, the nature of the participation continues to be different than that of men -- keeping women economically disadvantaged, lower in status, and burdened with multiple roles (Betz & Fitzgerald, 1987).

One major problem in the nature of women's participation in the labor force is the wage gap. The fight for equal pay for equal work is not a new issue. Women began joining trade unions over 100 years ago to attain more equitable working conditions. However, despite decades of social, legislative and demographic changes, "... the average woman earns 70 cents for every dollar earned by the average man when 1989 median weekly earnings of full-time wage and salary workers are compared" (U.S. Department of Labor Women's Bureau, 1990, p. 3). According to Gibson and Fast (1986), one reason for the
wage gap is due to women's intermittent employment histories. As a result of women periodically leaving the workforce to bear and raise children, meeting the requirements (time and experience) for higher paying positions, takes a longer period of time. In addition, women are more likely than men to work part-time in an attempt to maintain both family and economic responsibilities. While it is clear that having children impacts women's employment participation, it does not explain the fact that in 1988, the median earnings for men employed full time, year round was $26,656 while that for women was only $17,606 (U.S. Department of Labor Women's Bureau, 1990). "Studies suggest that even after equalizing for differences in training, experience, age, etc., there still exists a gap between men's and women's earnings that can only be attributed to discrimination in the workplace" (Gibson & Fast, 1986, p. 54). The wage gap and the employment histories of women contribute to the fact that the majority of individuals at poverty levels are women. Approximately 60% of working women make under $10,000 a year. The "feminization of poverty" is most prevalent among single female parent families. In 1988, families maintained by women represented 62% of all families below the poverty level (U.S. Department of Labor Women's Bureau, 1990).
Women are paid less than men for comparable work and they continue to be concentrated in occupations that offer low pay, low status and little opportunity for advancement (Betz & Fitzgerald, 1987). "Over half of all women work in two of the twelve major occupations as clerical workers and service workers" (Ferraro, 1984, p. 1167). The ten jobs employing the highest numbers of women in 1981 were secretary, elementary teachers, bookkeepers, cashiers, general office clerks, registered nurses, waitresses, nursing aides, textile sewing machine operators and assemblers. In 1989 80% of all administrative support (including clerical) workers and 68% of all retail and personal services sales workers were women (U.S. Department of Labor, 1990). Shortridge (1987) contends that while girls indicate interests in a variety of career fields (that include male-dominated occupations), when it comes to choosing, women opt for jobs within this narrow range of possibilities because the jobs have easy "in-and-out" access and can be secured in a variety of locations. What most women want are "... jobs where they can start out and re-enter again later in their lives, possibly on a part-time basis and possibly in a different city" (Shortridge, 1987, p. 47). As a result, women are found in occupations that offer both flexibility and low pay, in what Howe (1977) referred to as "pink-collar" jobs that include retail salesperson, beauticians, clerical and
Similarly, professional women are in positions that pay
less and are lower in status (i.e., nurse, elementary
school teacher, social worker, librarian) while men are in
the more prestigious and higher salaried professions of
medicine, law, engineering and science. Women are, in
fact, entering certain professions that once were male
dominated. The professional areas of accounting,
pharmacology, computer science, banking and financial
management are no longer considered non-traditional for
women since over 25% of those employed in each field are
now female (Gibson & Fast, 1986). However, the fields of
science and mathematics continue to be poorly represented
by women. Although engineering is the largest profession
in the country, in 1984 women earned only 10% of the
bachelors degrees in the field and in 1982 only 124 out of
2500 engineering doctorates awarded in the United States
went to women (Pfafflin, 1984). "Although women made up
about 45% of the professional work force in the United
States in 1983, they made up only about 13% of the science
and engineering work force" (Pfafflin, 1984, p. 1183).
Examination of the same occupation or occupational field,
reveals a disparity in position levels between men and
women, with women at the lower levels and men at the upper
levels (Gottfredson, 1981). A breakdown by gender within

house cleaning services.
the teaching profession indicates that the number of women teaching elementary school (86%) is far higher than the number of women employed as school administrators (26%). Women constitute 51% of instructors in universities, however, only 5% are full professors (U.S. Department of Labor, 1977). Thus, at all levels of the work force women are predominately found in lower-level, lower-status, and lower-paying occupations. More importantly, young women and girls continue to choose traditionally female occupations. According to Betz and Fitzgerald (1987), recent studies suggest that "... in comparison to men, women continue to select occupations from a more restricted range of options, ... see fewer occupations as suitable, ... and choose occupations less consistent with their vocational interests" (p. 8). It appears that traditional female stereotypes prevail in our culture to the extent that they are continuing to keep women in their place.

Theories of Career Development

The origins of career development theory and practice can be traced to Frank Parsons who established the "matching men and jobs" approach to career choice in 1909. In his book, Choosing a Vocation, he specifies that the process of career choice involves three steps: 1) self-knowledge,
2) knowledge of occupational alternatives, and 3) "true reasoning" to find a match between person and job. Since that time, Parson's theory has been utilized extensively in vocational counseling and has been the basis on which other major career theorists (including Anne Roe, John Holland, Donald Super, the Ginzberg group) have developed career choice theories. The primary concern of Frank Parsons as well as these more recent career theorists was facilitating the occupational choice process of white males.

Anne Roe's (1957) theory of vocational choice is based on the integration of the work of personality and ego psychologists with Maslow's "need" theory and with genetic and evolutionary theory. The basic premise of her theory states that the parenting style (concentration on child, avoidance of child or acceptance) mediates an individual's need hierarchy which then influences vocational choice in relation to genetically determined skills and abilities. Roe also developed a "two-way" classification of occupations that includes eight occupational groups (service, business contact, organization, technology, outdoor, science, general culture, and arts and entertainment) and six levels of difficulty and responsibility (professional and managerial 1, professional and managerial 2, semiprofessional and small
business, skilled, semiskilled and unskilled) (Roe & Lunneborg, 1984).

Holland's (1966; 1973) theory of vocational choice is based on the assumption that there is a relationship between personality (that includes an individual's motivation, knowledge and ability) and vocational choice which is largely influenced by stereotypic typologies of occupations. He contends that there are six personality types: realistic, investigative, artistic, social, enterprising or conventional and most individuals can be categorized as one or a combination of the types. Similarly there are six environments whose members are, for the most part, those categorized in the corresponding personality type. Holland believes that individuals search for environments that will allow for utilization of skills and abilities and opportunity for expression of attitudes and values. A satisfying vocational choice is determined by the congruence or quality of fit between a person's personality type and present environment.

Eli Ginzberg and his colleagues (1966) present a developmental theory of vocational choice based on maturation and the process of occupational choice. He identifies several stages and substages that an individual moves through beginning at birth and ending at
approximately age 22. Each stage and substage is characterized by a particular developmental task with the ultimate goal of selecting an appropriate occupation. Adolescence is emphasized as an important time in which developmental tasks are mastered allowing the individual to move through the sequential substages of exploration, crystallization and specification.

Super (1966) defines his theory of the development of vocational behavior as the implementation of an individual's self-concept through the integration of biological, psychological and sociological influences. Super's major theoretical tenets of vocational choice are:

First, that people differ in personality, abilities, and interests and are therefore qualified for a variety of occupations, while each occupation requires a certain pattern of personality traits, abilities and interests in its workers. Second, people change with time and experience so that vocational choice and subsequent adjustment to that choice is a continuous process. Finally, the process of vocational development is essentially that of developing and implementing a self-concept through a complex, interactional process of genetic aptitudes, physiological make-up, opportunity to play social

The process involves progressing through a series of stages in which the self-concept is continually evolving and becomes more differentiated and complex with maturation. The vocational self-concept emerges over time as part of the developments of the general self-concept. While these theories of career development have added to the knowledge of male vocational choice, they have been criticized for excluding women in theory development and testing and for claiming that there is no difference in the career development of men and women.

Roe and Lunneborg (1984) admit that their occupational classification system is not applicable to women, except for those who enter a career and continue without interruption. "Now that so many women are not only housewives but working outside the home, it seems insufficient to categorize them only by their paid (or volunteer) jobs, and, unless one follows the frequent moving into and out of the workplace, it becomes even clearer that something else is needed for them" (Roe & Lunneborg, 1984, p. 41-42). Perun and Del Vento Bielby (1981) contend that Roe's model does not meet criteria specified in a human development approach to female
occupational behavior. In particular, the model is essentially static and does not offer an explanation for what occurs beyond early childhood or for the possibility of inconsistencies in parenting style. Further, the model does not take into account the social context of the process.

Ginzberg's (Brown, 1984) initial study consisted of upper income males from Protestant or Catholic backgrounds. He included two other groups: high school males from low income families and ten college women - seven Barnard sophomores and three Barnard seniors. Perun and Del Vento Bielby (1981) reject Ginzberg's theory on the basis of his less than representative sample of women. Based on this sample, however, Ginzberg (Diamond, 1987) asserted that the only difference between the career development process for men and women is that women became concerned with marriage toward the end of their undergraduate studies which impacted career planning. Three different groups emerged among these women: marriage-oriented, work-oriented, and women hoping to combine both. In the 1970's Ginzberg (1972) concluded that the male model of career development was not applicable to women due to interruptions in educational and career planning for marriage and family.
John Holland's theory has received numerous criticisms questioning whether his male model of vocational choice fits the female prototype. Even Holland (1966) critiqued his own theory on this point stating that,

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

Despite the assertion that his theory does not adequately describe women's vocational behavior, Holland's model is widely used with both men and women. Particular problems have emerged as a result of utilization of the Self-Directed Search, Holland's vocational interest inventory. Individuals taking the inventory receive scores based on the six dimensions of his theoretical model. Men generally score higher than women on Realistic/Investigative/Enterprising (RIE) codes, whereas women usually score higher than men on
Social/Artistic/Conventional (SAC) codes. There are questions surrounding these differences pointing to sexism (Weinrach, 1984). A summary code of Social/Artist/Enterprising (SAE) is often obtained by homemakers or women who have never worked outside of the home. Similarly, Perun and Del Vento Bielby (1981) assert that a major problem in Holland's theory is the use of occupational stereotypes which severely limit women's occupational choices. Holland (1975) counters accusations of bias with the contention that individuals are defined by their life histories, which determine suitability for some groups of occupations and not for others. Holland also fails to specify a developmental process (Perun & Del Vento Bielby, 1981) and conceptualizes the construct of personality as somewhat static and unchanging (Diamond, 1987). Diamond (1987) further contends that the belief that women have no opportunity to change with regard to career orientation, interests and goals perpetuates the status quo, preventing women from moving beyond stereotypic roles.

Super (1957; 1984) does offer a developmental model. He contends that career patterns of men can be applied to women as long as marriage and childbearing variables are taken into consideration. He specified patterns for women as stable homemaking, conventional (working followed by
marriage), stable working, double-track (working while homemaking), interrupted (working, homemaking and working, either while homemaking or after having given up homemaking), unstable and multiple-trial. Men's career patterns were less complex and included: stable, conventional, unstable and multiple-trial. Super also asserts that the role self-concept plays in male and female career development is the same. This notion has been challenged by many (Forrest & Mikolaitis, 1986; Gilligan, 1982; Perun & Del Vento Bielby, 1981; Stonewater, 1987) who suggest that self concept may be implemented differently in women than in men.

Osipow (1975) has been particularly critical of the application of theoretical constructs based on male models of career development to women. Problems with developmental models, such as Super's, occur when one set sequence of developmental stages is applied to both men and women. The developmental stages of exploration and specification (postulated by Super) do not accurately describe the career development of women. Female adolescent exploration may be pseudo-exploration, pending marriage plans. The more significant career development of women may occur later, after children have been raised. As a result the establishment and maintenance stages would be delayed. As more and more women delay marriage and
childbearing until their 30's and are well-established in careers, interruptions in the establishment and maintenances stages may also occur. Osipow (1975) further asserts that the implementation of a self concept through the choice of an occupation may result in frustration and conflict for women who perceive a role split between mother-wife-worker. There are also problems with matching models of career choice due to the assumption that choices can be freely and equitably based on a variety of occupations. Women's socialization, however, restricts the number of occupational options available to her. Occupational choice based on the implementation of personality types limits the range of role types for women. Fitzgerald (1986) states, "... both the personal and environmental components of the matching model may be distorted by the expectations and requirements of sex roles..." (p. 119). With regard to Holland's concept of occupational environments all six environments are not readily available to white middle-class females. Osipow (1975) states that, "For such women, the choices are predominately in the Social or Conventional areas, with certain selected possibilities in Artistic and Investigative" (Osipow, 1975, p.18). The Realistic environment is essentially closed to women. Nieva and Gutek (1981) contend that matching an individual's abilities to job requirements is a more appropriate
approach than matching personality to job requirements and results in a wider range of occupations available for both sexes.

The question remains controversial: Should there be separate theories to explain the career development of men and women? Osipow (1983) indicated that despite certain similarities between the sexes in the career development process, there are enough significant differences to develop separate theories for each, "... at least until such time as true sexual equality of career opportunities exists and the results have permeated society at all levels" (p. 263). Gutek and Larwood (1987) agree that women's career development is different and is likely to remain different in the near future. Research conducted by Gilligan (1982) has shown distinct gender differences in the developmental process. In order to account for the unique experiences of women's development, a separate model is needed. On the other hand, Fitzgerald and Crites (1980) believe that the basic needs and aspirations satisfied through work are no different for men and women and that existing career development theories can be utilized with women. However, they observed that differences in socialization and the resulting internal and external barriers to career development (Fitzgerald & Betz, 1983) cause the career development process to be
more complex for women.

The barriers to career development or those influences that prevent girls and women from making appropriate occupational choices based on abilities and potentialities include both psychological (internal) barriers and environmental (external) barriers (Betz & Fitzgerald, 1987; Farmer, 1976; Fitzgerald & Betz, 1983). One of the most difficult aspects of career planning and occupational choice for women is envisioning how marriage, children and work will fit together. This home-career conflict often involves a belief system of "I can't do both" or involves making occupational choices that the woman perceives will accommodate the combination of working and managing the home and children (i.e., teaching, nursing, clerical work). This syndrome is a direct result of the effects of woman's socialization process and involves "... the expectation that all women will or should engage in child rearing and the concomitant notion that child rearing is antithetical to, or takes precedence over career involvement" (Fitzgerald, 1986, p. 120). The reality is that successfully combining marriage, children and work is not easy to accomplish, especially for women who choose to pursue high level professional positions. Houseknecht and Spanier (1980) found that women with five or more years of post secondary education have one of the highest rates of
marital disruption. In addition to the home-career conflict, there are other negative effects of socialization which impact occupational choice. Fear of success (Horner, 1972) involves the belief that men are threatened by successful women and therefore to avoid ending up without a marriage partner, achievement oriented aspirations are rejected by women. Similarly, fear of math leads to avoidance of math coursework and the resulting elimination of many excellent career directions. Women also tend to underestimate their capabilities. Meece, et al. (1982) found that women tended to provide lower estimates of their abilities, performance and expectancies for future success in many achievement situations, despite the fact that their performance was better than that of males.

External or environmental barriers to women's career development are the direct result of a sex-biased society delineating prescribed roles to women and men. The notion that some occupations are appropriate for women and others are appropriate for men is a common and durable belief among adults (Shinar, 1975; White, Kruczek, Brown & White, 1989) and children as young as 2 1/2 (Gettys & Cann, 1981). Occupational stereotyping serves to maintain the status quo that women should stay in "female occupations". Further, this idea is reinforced through bias from
counselors. Studies (Ahron, 1976; Medvene & Collins, 1976) indicate that counselors (in particular those working in schools) held sex-biased opinions regarding occupational choice for women and the appropriateness of combining the roles of wife, mother and worker. Lack of women role models continues to be a problem that prevents women from moving outside traditional female roles and occupational choices. Tidball (1980) found that in colleges where there were higher numbers of female faculty members, there were more high-achieving female students. It is essential that young women have the opportunity to see older women who have succeeded in traditionally male career fields as well as those who have successfully combined marriage, family and work. Similarly, support for career-oriented women from counselors, parents, faculty and peers is an important key to achieving goals but is lacking in women's career development. Farmer (1985) found a strong relationship between parental support and young women's career aspirations and motivations. Freeman (1975) conducted a study at the University of Chicago which involved surveying male and female students to determine how much and what type of support they received for educational and career pursuits. Although men indicated that the university environment was more supportive than women, both groups perceived faculty as generally unsupportive. However, compared to males
female students indicated that they received little support from other people in their lives -- parents, siblings, friends, etc. Freeman (1975) concluded that because the academic environment offered neither encouragement nor discouragement to either male or female students and did not take into account the differentiating external environments from which women and men students come, women were in fact being discriminated against. Female students who are successful in achieving career-oriented goals must rely on other means for survival, outside the "null academic environment".

Perhaps the biggest argument in favor of separate career development theories for men and women comes from Chodorow (1978), Gilligan (1982), Josselson (1987) and Lyons (1983) who view female and male identity formation as very different. Since most vocational theories incorporate constructs of identity or self-concept, it is important to understand what these differences are and how they influence the socialization process and resulting occupational development.

According to Chodorow (1978) female identity formation occurs in a context of ongoing relationship due to the identification process that occurs between mothers and daughters. Girls identify with the mother and learn
empathy from her. Due to the amount of time females spend in the attachment process with the mother, relationships and connectedness become an important focus. The experience of attachment becomes fused with the process of identity formation for females. For boys, this process is very different. The male developmental pattern is associated with separateness due to the differences experienced through the mother-son relationship. Mothers view their sons as a male opposite and boys in defining themselves as masculine separate themselves from their mothers. As a result,

... relationships, and particularly issues of dependency, are experienced differently by women and men. For boys and men, separation and individuation are critically tied to gender identity since separation from the mother is essential for the development of masculinity. For girls and women, issues of femininity or feminine identity do not depend on the achievement of separation from the mother or on the progress of individuation (Gilligan, 1982, p. 8).

Masculinity is defined through separation while femininity is defined through attachment and each definition is played out differently in the life roles that men and
women undertake.

For example, the male model of development emphasizes career, achievement and identity tied to the self in the public world. Relationships for men within this context tend to be hierarchical in nature and are viewed as self-serving. Gilligan (1982) indicates that the male model of development as proposed by Levinson, views relationships as tasks that need to be accomplished within a particular stage before progressing to the next stage. Once accomplished, they are discarded in order to make room for other relationships that offer what is needed. The female model, however, emphasizes relationships as primary. The life cycle is tied to the family cycle and a woman's identity is determined by relationships. Different from a man's hierarchical view of relationships, women view relationships as a web of interrelated connections, that join the past with the future. This may explain why men are able to view their roles as husband and parent as separate from their worker role, while women perceive the roles in their lives as linked together (Tittle, 1982). Decisions women make in one area of their lives impact decisions in other areas. A decision to have a child may mean postponing one's career entry, which might lead to a sense of dissatisfaction and lack of fulfillment. The lack of an adequate friendship network may make an
unanticipated divorce particularly difficult, causing depression and lowering a woman's self-esteem. The decision to enter a demanding profession may result in a postponement of marriage and the inability to find friends with similar interests. The combinations are endless. (Evans, 1985, p. 20) Women's roles cannot be viewed as separate and distinct, but instead are interrelated and have been described by McGuigan (1980) as "... a braid of threads in which colors appear, disappear and reappear" (p. xii). Similarly, Josselson (1987) in her longitudinal study of the development of identity in women indicates that, "Women, by contrast, (to men) orient themselves in more complicated ways, balancing many involvements and aspirations, with connections to others paramount; their identities are thus compounded and more difficult to articulate" (p. 8). Men's patterns of career development are less complex and more predictable than women's patterns.

In response to the complexity of women's life roles, Walton (1986) poses the question, "Can you really be both?" (p. 11). Can a woman be both an intelligent, competent and ambitious worker as well as a loving, caring, nurturant and responsible wife and mother? Are these two (or three) selves compatible or are they at odds with one another? Walton (1986) emphasizes the importance
of women developing a self image that combines the striving for personal excellence with a caring concern for others. The desire to achieve this combination may be the reason why women today are (still) choosing traditional careers. By choosing occupational fields, such as education, nursing, social work or library science, women are able to maintain a caring concern for others and still strive for personal excellence within that framework. Osipow (1983) indicated that one explanation for the frequency of women choosing sex-stereotyped occupations is a result of their desire to effectively combine home and career.

Early studies to explain the career development of women focused on aspects of career development that were unique to women. These studies were not concerned with the nature of vocational choices made by women but instead whether or not and why women pursued careers in the first place. Hoyt and Kennedy (1958) attempted to differentiate homemaking versus career-oriented women through the interpretation of an interest instrument (the Strong Vocational Interest Blank --Women). Results indicated that career-oriented women scored higher on six scales, including, artist, lawyer, psychologist, physician, and physical education teacher, while homemaking oriented women scored higher on eight scales, including housewife,
secretary, home economics teacher, and dietician. This distinction, however, is less applicable today as women are now choosing to pursue both roles. In 1978, Blaska stated, "Deciding whether a homemaking or a career orientation is primary may be a moot point as women redefine their role to include an equal concern with academic and vocational success..." (p. 304). The majority of women today are not making either-or choices, but instead are questioning how they can manage both roles (Perun & Del Vento Bielby, 1981; Richardson, 1974; Rooney, 1983). Rand and Miller (1972) conducted a study of females at three levels of development (junior high school, high school and college) and found at each level a desire for both career and marriage. These researchers concluded that a new cultural imperative is emerging in which marriage and career are seen as compatible for women.

As women's vocational behavior changed, the approach towards explaining women's career development shifted. Occupational choices were classified in relation to the nature and degree of career orientation. A traditional orientation described women pursuing traditional female careers or those occupations in which women dominated versus a non-traditional orientation that involved pursuing careers in which men dominated. Rossi (1965)
utilized the term "pioneer" in referring to women choosing non-traditional occupations while others (Almquist, 1974; Tangri, 1972) described this same group as "role innovators". These three terms "nontraditional", "pioneer" and "innovator" have been used interchangeably to describe women pursuing male-dominated fields. There were a number of studies conducted in the early 1970's that examined the differences between traditional and non-traditional orientations among women (Astin & Myint, 1971; Nagely, 1971; Standley & Soule, 1974; Tangri, 1972).

The concept of career orientation was expanded further by Eyde (1962) who proposed a scale (Desire to Work Scale) to assess career orientation as a continuous variable. The instrument was designed to measure an individual's degree of preferred work involvement regardless of involvement in the homemaker role. The Desire to Work Scale was adapted by Almquist and Angrist (1970, 1971; Angrist, 1972) and was used to assess "career salience", defined as the extent to which work is viewed as primary in one's life and the desire to work regardless of financial need. These researchers examined work involvement in relation to certain family conditions and adult role aspirations and preferences through the use of their instrument called the Life Style Index.
Richardson (1974) measured 14 career orientation variables and work values in an attempt to clarify the meaning of career orientation. Results of the study indicate that career orientation is a "... multidimensional construct in which motivation to work and role values are central" (Richardson, 1974, p. 170). Two major orientations toward the world of work were found among college women: career-oriented women and work-oriented women. The former group was described as having long-term career goals which were of primary importance in their future plans. The work-oriented women, on the other hand, planned to combine work and homemaking roles by choosing a more traditional occupation. While work was viewed as part of their plan, it was not a central focus.

Both Osipow (1983) and Betz and Fitzgerald (1987) have pointed out difficulties in describing women's vocational behavior utilizing a single distinction, such as career orientation. The concept of traditional versus nontraditional orientation involves an either-or choice that presents problems in terms of current application. A traditional woman was one who entered a traditional occupation such as nursing, teaching or social work with the notion of stopping out for marriage and/or children. Nontraditional women were those who entered male-dominated occupations (medicine, law, engineering) and were strongly
committed to their careers. This dichotomy is not as distinct today. For example, a female nurse may be committed to her career and not plan to stop out for childrearing, while a female attorney may be more traditional in terms of family and children.

Career patterns were also developed in order to better explain women's vocational behavior. Although the majority of Super's (1957) theoretical work focused on the career development of men, he described seven different vocational patterns of women's career development, which were based on two observations: the centrality of the homemaker role in women's lives and the recognition that many women were entering the labor force. Zytowski (1969) set forth nine postulates that characterized women's participation in the labor force. While he believed that the primary role for a woman was homemaker, he also noted that the role was not static and may change in the future. Zytowski proposed 3 vocational patterns for women based on 3 aspects of vocational participation: age of entry, span (length in years) of participation, and degree of participation (traditionality versus nontraditionality). Zytowski (1969) states that, "The pattern of vocational participation is determined jointly by preference (representing motivation) and by external, situational and environmental, and internal, such as ability, factors" (p.
The three patterns he suggested include: 1) The "mild" vocational pattern: early or late entry and brief and low-degree participation; 2) The "moderate" pattern: early entry and lengthy span but low degree participation; and 3) The "unusual" career pattern: characterized by early entry, lengthy or uninterrupted span and a high degree of participation.

Both Wolfson (1976) and Betz (1984) utilized Zytowski's career patterns to investigate applicability. Wolfson found two additional career patterns: "never worked" and a "high moderate" pattern that included women whose span of participation was 18 years or more. Other results indicated that variables pertaining to marriage and education were the most influential in discriminating among vocational patterns and that 4 variables: graduation from college, a vocational major, attendance in graduate school and an unmarried status were most descriptive of women in the "high-moderate" and "unusual" patterns. Ellen Betz (1984) revised Zytowski's (1969) and Wolfson's (1976) categories and proposed seven categories to describe all possible combinations of high, medium and low span of participation, male-dominated and female-dominated degree of participation and the never-worked category. Using the revised categories, Betz conducted a ten year follow-up study, investigating the career
patterns of women college graduates of the 1960's. Results indicated a change in women's lifestyles. She found the majority of subjects falling into the high (59%) and moderate (25%) commitment categories, while 23% of the sample were categorized as high commitment to a pioneer occupation. This latter category is the group that Zytowski (1969) referred to as "unusual".

Sobol (1963) was among the first to propose the use of variables as influential determinants of women's career development. Based on her theoretical question, "What are the factors which lead a wife to formulate long-range work plans" (Sobol, 1963, p. 46), she divided the influences on work decisions into three major classifications: a) enabling conditions (family status), b) facilitating conditions (ease in obtaining work) and c) precipitating conditions (relative dissatisfaction that includes financial and attitudinal factors). These factors continue to be important issues that impact the career decision-making process for women. Psathas (1968) emphasized cultural, situational, and chance elements in the environment and cited intentions to marry, time of marriage, husband's economic situation and attitudes towards his wife working, and the sex role preference of the woman as influencing a woman's decision to work.
Several studies (Matthews and Tiedemen, 1964; Falk & Crosby, 1978; Farmer, 1976) have focused on the conflicts or barriers that women face in making vocational choices and were based on "... a concern with women's lack of vocational achievements and failure to utilize their abilities and talents" (Betz & Fitzgeral, 1987, p. 25). These approaches focus on the effects of the socialization process and describe specific problems unique to females. For example, Betz and Hackett (1981) found that a major factor contributing to the restriction of women's career options is low self-efficacy expectations. These researchers contend that the utilization of a self-efficacy approach may be particularly relevant to the understanding of women's career development.

Gottfredson (1981) developed a model of career development based on the concepts of circumscription and compromise. She proposed that society functions to restrict the number of occupational options to a limited range of sex-appropriate choices. This range is usually established by the age of 6-8 years and can only be altered through unusual circumstances. If this theory is accurate, it would serve to reinforce societal sex-role norms in relation to occupational choice and indicate a negative picture for change. However, studies conducted to test Gottfredson's model have so far, not been supportive.
Astin (1984) proposed a model of career development that she believes is applicable to the occupational behavior of both men and women. The model is described as a socio-psychological model that incorporates 4 major constructs: motivation, work expectations, sex-role socialization and the structure of opportunity. It is a developmental model that attempts to explain changes in career choice and work behavior through the structure of opportunity. Astin's model has received both praise (Farmer, 1984) for offering a fresh, new approach to the field of women's career development and criticism (Fitzgerald & Betz, 1984; Harmon, 1984) aimed at poorly defined constructs and the need for more conceptual and empirical work.

Other theorists have attempted to integrate variables in response to the uniqueness of women's career development. Osipow (1975) and Senesh (1973) emphasized individual factors, social factors and moderating factors while O'Neil, Meeker, & Borgers (1978) focused on individual, familial, societal, psychosocial, socioeconomic, and situational variables in describing the career choice process. Farmer (1985) developed a model in which female adolescents' career motivation (aspiration, master and
career commitment) were influenced by a series of 3 interacting variables (background, psychological and environment). The advantage of this model is the multidimensionality at both the independent and dependent variable levels. Fassinger (1985, 1990) tested a multidimensional model, originally proposed by Betz and Fitzgerald (1987), that incorporated background, psychological and environmental variables. Multivariate causal modeling techniques were applied to predict women's career orientation and choice. Tittle (1988) developed a model that specifies the plans for, attainment of and satisfaction in, adult roles. Based on gender research and theory, the model is not limited to examination of choice and satisfaction for the worker role alone, but instead offers a life patterns perspective that focuses on the integration or ways in which individuals develop patterns for the major roles of worker, spouse, homemaker and parent.

Independent Variables

In an extensive review of the literature on women's career development, Betz and Fitzgerald (1987; Fitzgerald & Betz, 1983) have conceptualized women's career choice in terms of dependent and independent variables. Dependent variables pertain to those variables that describe women's
career development and how it is different from men's career development. These variables were reviewed in the last section and include distinctions such as, homemaking versus career orientation; career orientations (i.e., traditional versus nontraditional); and career patterns. Betz and Fitzgerald (1987) also described independent or predictor variables, categorized as environmental/sociocultural and individual variables related to women's career development. They point out that previous research utilizing the major independent variables have indicated the importance of marital/familial status, sex role attitudes, and role conflict variables in the study of women's career choice. These variables along with ability/achievement, mathematics orientation and self-esteem will be examined in the following section. Pertinent research in which these variables have impacted women's vocational behavior will be reviewed to provide support for their inclusion in this study.

**Ability/Achievement.** There appears to be a direct link between the intellectual functioning and abilities of men and their occupational success (Crites, 1969; Tyler, 1965). However, for women, this relationship is less predictable. At all educational levels (from grade school through college), females consistently perform better
academically than males even in those areas in which boys score higher in ability tests (Carnegie Commission on Higher Education, 1973; Hyde, 1985; Tyler, 1965). Girls are also ahead of boys with regard to school progress. Girls less frequently have to repeat a grade and are more often accelerated and promoted. However, beginning in adolescence, the relationship between ability and educational/occupational levels weakens and by college age the relationship is even less apparent, resulting in women choosing occupations within a narrow range of traditionally female majors (Pfafflin, 1984; Randour et al., 1982). According to Hyde (1985), "... standard biographical dictionaries generally show that less than 10% of the people who have achieved eminence have been women, and generally more than half of these are listed because they were sovereigns by birthright (Anastasi, 1958) or the wives or mistresses of famous men!" (p. 197).

The career aspirations and choices of women are frequently at lower levels than men's aspirations even when abilities are comparable (Fitzgerald & Crites, 1980). In follow-up studies conducted by Terman and Oden (1959) of over 1500 California children with I.Q.'s of over 135, these researchers found male subjects at mid-life employed in a variety of professions, including medicine, law and the sciences. Many of them had made significant literary and
artistic contribution. The female subjects, on the other hand, were found in traditional female occupations, such as secretary, teacher and nurse. Over 50% of these women were housewives who had never worked. Similar results were found in a more recent study conducted by Card, Steel and Abeles (1980). These researchers utilized subjects in grades 9-12 from the Project Talent study in 1960. Longitudinal data was collected 1, 5 and 11 years after the date of their expected high school graduation. Results indicate sex differences on indices of achievement and achievement potential. At age 14, females had higher scores on academic aptitude composite and earned significantly higher school grades than males. However, by age 29, males had surpassed females through attaining higher achievements educationally and occupationally. Women continue to underutilize their abilities preventing them from living lives in which their potentialities can be realized.

Major reviews examining sex differences in general intellectual functioning as well as specific abilities including verbal, mathematical and spatial have been conducted by Maccoby and Jacklin (1974), Hyde (1985), and Hyde and Rosenberg (1980). According to Hyde (1985) while there have been numerous studies conducted attempting to prove a sex difference in intellectual functioning, the
results have failed to reveal any gender differences in this area. However, analysis of specific abilities in males and females may be more revealing. Both Maccoby and Jacklin (1974) and Sherman (1978) contend that females are superior to males in verbal ability. Girls tend to have an advantage over boys in language development as early as ages of two or three. This advantage becomes more apparent around age 11 and girls continue to perform better at verbal tasks such as spelling as well as more complex tasks including analogies and creative writing. It is important to note that this difference in verbal ability has been found across cultures (Mead, 1958). In contrast, males tend to perform better at spatial ability tasks and on numerical tests than females.

Both Betz and Fitzgerald (1987) and Maccoby and Jacklin (1974) assert that these results must be interpreted with caution. Consistent sex differences in verbal, mathematical and spatial abilities do not emerge until adolescence which lends support to the notion that these sex differences may be attributed to learned sex-role characteristics and cultural expectations for females and males. Hyde and Rosenberg (1980) re-analyzed the statistics from the studies employed by Maccoby and Jacklin on verbal, mathematical and spatial abilities and found gender differences to be generally small. Betz and
Fitzgerald (1987) point out that there are a number of studies in which sex differences do not exist or have found differences in the opposite direction. In addition, these authors contend that performance on ability tests and previous educational background and experience cannot be examined separately. In conclusion, sex differences provide little explanation for individual differences of female underachievement.

Personality factors that may act as barriers to women's achievement include achievement motivation, the motive to avoid success and expectations about success (Hyde, 1985). Previous research on gender differences indicated that females have a lower level of achievement motivation than males (Hoffman, 1972; Tyler, 1965). However, others (Maccoby & Jacklin, 1974) have disputed these findings based on the different conditions in which subjects may be tested. Under "neutral" or "relaxed" conditions females perform higher on achievement motivation than males, however, the reverse is true given an "achievement arousal" condition. In competitive situations men show higher achievement motivation than women. Not only does achievement motivation depend on the situation in which the motive is measured, it also depends on age and stage of development of the individual. Due to the issues of marriage and family that impact women's occupational
choice and career orientation achievement motivation may be delayed until after marriage and childbearing.

In studies conducted on bright, high-achieving women, Horner (1972, 1978) found a motive to avoid success or fear of success when these subjects encountered achieving, competitive situations. Women high in fear of success planned majors in humanities and careers as housewives or teachers, while those with low fear of success chose non-traditional majors in science and mathematics and planned to attend graduate school. Horner (1972) asserts that the motive to avoid success is a direct result of the conflict between achievement and femininity as well as the perceived relationship between achievement and aggressiveness. While fear of success appears to be a plausible explanation for the gender disparity in achievement, there have been a number of studies (Cherry & Deaux, 1978; Tresemer, 1974; Zuckerman & Wheeler, 1975) that have criticized Horner's research and have found men affected by the motive to avoid success as much as (and in some instances, more than) women.

Although the relationship between ability and occupational achievement is frequently complicated by underutilization issues for women, there is evidence indicating that females with high academic abilities tend to be more
career-oriented (Astin, 1968; Fassinger, 1990; Rand, 1968; Tinsley & Faunce, 1978). In addition, women choosing nontraditional majors and male-dominated occupations were characterized by high ACT scores and high academic ability (Carney & Morgan, 1981; Peng & Jaffe, 1979). Lemkau (1983) found that women in sex-atypical occupations (i.e., accounting, engineering, chemistry) were brighter than those in sex-typical occupational fields (i.e., library science, nursing, elementary education). While ability and achievement are significant variables to consider in women's career development, the nature and level of obtained education is considered to be one of the most important variables in the study of women's vocational behavior (Gysbers, N., Johnston, J., & Gust, T., 1968; Harmon, 1970; Wolfson, 1976). Several studies (Blaska, 1978; Fox, 1984; Houseknecht & Spanier, 1980; Vetter, 1980) indicate that the amount of education a woman has often determines whether the woman will be working outside the home regardless of marital or parental status.

Education strongly impacts women's opportunities in work and society (Fox, 1984). Not only does the amount of education a woman has influence her employment status, it also affects her potential for occupational advancement. According to Featherman (1980), educational credentials continue to be critical for women in order to obtain
promotions and advance throughout their careers. For men, educational credentials are important in attaining the initial job but after that job-related experience is a more highly valued criteria for advancement. It has also been found that educational attainment influences occupational choice. Greenfield, Greiner and Wood (1980) studied background factors, definitions of "success" and attitudes toward working in general in distinguishing women in male-dominated jobs from women in female-dominated jobs. Women in male-dominated jobs were older (over 35 years) and better educated (at least a college graduate). The more education a woman attains, the more options she has not only in obtaining her first job but throughout her working life.

In a broader sense the number of women in higher education impacts the next generation in setting an example of the status of women in society and is a reflection of American societal trends (Fox, 1984). In the last two to three decades, there have been dramatic changes in society's view of women attending institutions of higher education. Up until that time men were more likely than women to receive a college education. In terms of education, sons tended to be given encouragement as well as financial support, while daughters were not expected nor given the means to go beyond the high school level. Since that time
the number of women attending college has been increasing, while the number of men attending college has remained the same. By 1984, approximately 52% of college students were women (Shavlik & Touchton, 1987). While women have made major gains in higher education, certain patterns, especially the sex segregation of educational fields, persist (Feldman, 1974; Fox, 1984; Randour, Strasburg, & Lipman-Blumen, 1982). At the undergraduate level, men are twice as likely as women to major in business and physical sciences and nine times as likely to major in engineering. Women tend to concentrate in humanities, certain health fields and education. There is a distinct difference in both salary and status in classifying those fields of study chosen by men and women. According to Fox (1984), "... undergraduate men are clustered in areas that lead to better paying, higher status jobs in science, business and technology -- while women cluster in the poorer paying, lower status areas in the arts, health and education" (p. 242).

In the last twenty years women have also made gains at the graduate and professional educational levels. In the early 1960's women earned only about 3% of all professional (e.g., medical, dental, law, veterinary) degrees awarded. By 1979 this percentage had climbed to 24%. Similar increases are noted among women attaining
doctoral degrees. Women received 14% of all doctorates in 1970, 23% in 1975 and 28% in 1980. However, similar to the undergraduate level, sex differences prevail in field of study at the doctoral level. Brown (1979) found that over half the women at the master's level and over a third at the doctoral level were concentrated in various education disciplines. Women pursuing doctoral degrees also tend to choose the areas of literature, biological science, language and certain social science; all of which are considered traditional female fields.

Women are also faced with sex-biased processes and discrimination in higher education (Association of American Colleges, 1982). Faculty tend to encourage male compared to female students through subtle nonverbal language (i.e., making more eye contact with men, acknowledging responses to men's questions by nodding and gesturing, appearing particular attentive when men speak and positioning themselves close to male students). According to Fox (1984), "... these practices convey negative messages about women's value and status in the classroom, and signal their exclusion as significant members of the college community" (p. 244). Similar patterns are found at the graduate and professional levels, where women indicate that they are overlooked and neglected, especially in interactions and communications.
with faculty and research advisers outside of the classroom (Holmstrom & Holmstrom, 1974; Kjerulff & Blook, 1973). Other studies (Bernard, 1976; Holahan, 1979) report similar findings regarding faculty lack of support and negative attitudes toward female students. Women's limited contact with the faculty puts them at a disadvantage with regard to opportunity for advancement and serves to perpetuate male dominance in higher education. Complaints of discrimination among female faculty also exist and have been well documented (e.g., Lockheed & Ekstrom, 1977; Merritt, 1976; National Project on Women in Education, 1978). In a study conducted by Astin (1969) of women who received Ph.D.'s in 1957 and 1958, 33% of the respondents believed that discrimination against their sex had negatively impacted their career, 25% reported prejudice encountered in hiring, 40% in salary, 33% in tenure and promotion and 33% in assignment of administrative tasks.

The lack of support and encouragement women receive to pursue educational goals and to complete degree work is just as damaging to women's educational attainment as discrimination (Betz & Fitzgerald, 1987). A "null academic environment" or an environment that is lacking in support and encouragement was found in a study conducted by Freeman (1975). In this study a questionnaire was
distributed to both male and female students regarding the nature and amount of personal support they received for pursuit of their educational and career goals. Although the results indicated that males perceived more support from faculty than females, for the most part both men and women students felt a general lack of support from faculty. The difficulty for women in dealing with the "null academic environment" was the fact that they also received little support from parents, siblings, friends and spouses or boyfriends/girlfriends. Freeman (1975) contends that, "an academic environment that neither encourages nor discourages students of either sex is inherently discriminatory against women because it fails to take into account the differentiating external environments from which women and men students come" (p. 221). Female career-oriented students are left to their own individual resources to survive academically. With no real support system achieving success is difficult and often an impossible task. For example, Kutner and Brogan (1980) found that half of their sample of female medical students had been discouraged by parents or professors from attending medical school compared to only 14% of the males. Encouragement and support from faculty have been demonstrated to have a positive effect on women students. Feldmen (1974) found that male and female graduate students who had a close relationship with a professor
were more productive. "Among those having a close (apprentice or collegial) relationship, 43.7 percent of the men and 42.0 percent of the women have published an article; however, among those having a student-teacher, employer-employee, or no contact relationship with professors, 34.7 percent of the men have published, compared to 24.3 percent of the women" (p. 121). Relationships between female faculty members and female students may have an even greater impact on women in higher education. In a study conducted by Goldstein (1979), the number of published articles was higher among women Ph.D.'s who had female dissertation advisers compared to those who had male advisers. The positive effects of attending a women's college have also been reported. Tidball (1985) found that the national entry rate (into medical school) for women graduating from women's colleges was twice that of women from all coeducational institutions combined. Graduates of women's colleges were also twice as likely as women at coeducational institutions to be cited for career accomplishments in Who's Who of American women (Tidball, 1973) and to have earned research doctorates (Tidball, 1980). However, Oates and Williamson (1978) point out that the majority of women achievers are graduates of a small group of seven colleges where both selective admissions and socioeconomic level are critical factors in
Comparing graduates of women's colleges with female graduates of coeducational colleges and universities. Parental support is also an important factor in women's educational attainment. Farmer (1985) found parental support to be one of the strongest predictors of young women's career motivation.

Discrimination, sex-bias and lack of support also occur at the elementary and secondary educational levels. Sadker and Sadker (1985) found that teachers favor boys in the classroom through praising boys more than girls, giving boys more academic help and accepting boys' comments more frequently than girls in classroom discussions. Weltzman (1979) asserts that the educational system has generally reinforced sex role stereotypes and has consistently conveyed the message to girls at school that they are less important than boys. These stereotypes are communicated through elementary school readers, textbooks and educational achievement tests. Weitzman and Rizzo (1974) found that women are infrequently mentioned in important roles in history, as government leaders or as great scientists. Sexism also exists in teacher education texts. Sadker and Sadker (1980) reviewed the contents of 24 widely used teacher-education textbooks to determine how issues of sex equity in education were currently being treated. The results indicated that teacher-education
texts were characterized by an overwhelming lack of information on sex equity in education.

There is also evidence that higher education is related to other variables important in the career development of women. For example, higher educational attainment of women has been linked to postponement of marriage or decision not to marry, higher rates of marital disruption, and to bearing fewer children (Houseknecht & Spanier, 1980). Several studies (Greenfield et al., 1980; Mason & Czajka, 1976; Vetter, 1980) indicate a relationship between higher education in women and more liberal attitudes towards women's roles.

Mathematics Orientation. Participation in mathematics coursework has been found to be an important determinant in both academic and occupational choice for women. Ethington and Wolfle (1988) proposed a model hypothesizing patterns of effects to examine the manner in which factors influence women's choice of undergraduate fields of study. The results indicate that the number of mathematics and science courses taken in high school was the most influential variable in the model, having the largest direct effect on field of study. In an early study conducted by Sells (1973) of freshmen at University of California at Berkeley, she found that 57% of the boys had
taken four years of high school math (first year algebra, geometry, second year algebra, trigonometry and solid geometry) compared to only 8% of the girls. These four mathematics courses were prerequisites for math and science courses required for every major field at University of California except the fields of humanities, social sciences, education and social welfare; those fields of study considered to be traditionally female. Sells (1973) contended that high school mathematics is a "critical filter" in the job market. Fennema (1980) agrees, "... electing not to study mathematics in high school beyond minimal or college requirements is the cause of many females non-participation in math-related occupations" (p. 82). A decision to take only one or two mathematics courses at the high school level restricts the number of options available to female students. However, current data on high school mathematics course participation indicates that while sex differences in mathematics participation still exist, the numbers of women completing high school mathematics sequences have increased (Chipman & Thomas, 1985). Approximately 40% of women entering college have taken the standard four years of high school mathematics.

Despite such changes, women are not choosing fields of study that require mathematics. In 1979, women earned
only 3% of the doctorates in engineering, 11% of those in physics and 12% of those in business (Betz & Fitzgerald, 1987). There appears to be a combination of factors working together that continue to prevent women from entering the more technical fields that require training in mathematics.

Sex-related differences in mathematics ability continue to be a controversial topic. Fennema (1980) reviewed four major studies on mathematics ability/achievement and found no sex-related differences at any cognitive level at the elementary school level. Beginning in the 7th grade there appears to be some evidence that boys perform better than girls on tasks involving mathematical reasoning. Benbow and Stanley (1980) found a substantial sex difference in mathematical reasoning ability in favor of boys on mathematics test scores of the SAT. This study was comprised of 9927 intellectually gifted junior high school students. It is important to note that sex differences in mathematical reasoning ability was found in this study before there were differences in the number and types of mathematics courses taken. Fennema (1980) also found that sex related differences in mathematics learning at the high school level may be less than in previous years. Several researchers have suggested that sex differences in mathematics achievement can be explained by male
superiority in spatial visualization (Benbow & Stanley, 1980; Fennema, 1975; Maccoby & Jacklin, 1974; Sells, 1980). However, in the Fennema-Sherman (1977) study which was designed specifically to investigate the relationship between mathematics achievement and spatial visualization skills, Fennema (1980) contends that there is not significant data to support the idea that such a relationship exists.

Affective variables may also play a part in explaining sex-related differences in mathematics performance. The confidence-anxiety dimension in mathematics has been proposed by Fennema (1980) as an important explanatory variable. If it is true that individuals tend to avoid tasks that arouse anxiety and participate in those tasks in which they feel confident, this may explain women's avoidance of math coursework. Betz (1978) investigated the factors associated with the prevalence and intensity of math anxiety in college students. Two important results were reported: 1) math anxiety tends to occur more frequently among female college students than among males and among students with minimal high school math coursework and 2) there was a relationship between higher levels of math anxiety and lower mathematics achievement. Results of an early study by Crandall et al., (1962) indicated that girls underestimate their own ability to
solve mathematical problems. Lack of confidence in ability to perform mathematics may cause anxiety and result in avoidance of math coursework and/or low mathematics achievement. The stereotyping of mathematics as a male domain is also considered to be a perception held by girls and women that influences mathematics participation (Stein, 1971; Stein & Smithells, 1969). However, in a recent study conducted by Singer and Stake (1986), the women in the study denied that mathematics was a male domain and stated that they had participated in mathematics to a considerable extent. While these results indicate a change in women's attitudes towards mathematics, the change in attitude did not impact career goals. These women tended not to make math-related occupational choices. The results,

... suggest that, while there may be a general change in the surface attitudes of girls and women toward mathematics, some may nonetheless continue to have underlying reservations about their ability to perform mathematics and about the value of mathematics for themselves as women. These underlying concerns may be what we see reflected in women's real life choices and in their expectations within specific math situations. (Singer & Stake, 1986, p. 349)
Usefulness of mathematics has also been found to impact women's continuance in mathematics. Studies completed by Hilton and Berglund (1974) and Fennema and Sherman (1977) show that when compared with males, females tend to view mathematics as personally less useful. Results of the Women in Mathematics Survey, Fall 1978 indicated 12th grade males and females ranked usefulness of mathematics as the most important factor affecting their decision to take more mathematics courses (Armstrong, 1985).

It appears that there are a number of variables that impact women in terms of both mathematics achievement and mathematics-related occupational choice. Sherman (1983) contends that it is a network of sex-role influences that discourages women away from mathematics and mathematics-related careers as a result of a perceived incongruence between mathematics and the female role (and in particular with motherhood). Once women see that it is possible to combine motherhood and demanding careers, Sherman (1983) believes that women will view mathematics as a more viable option. However, it is important to emphasize the clear relationship between participation in mathematics and field of study. Women who complete four years of mathematics at the high school level are at an advantage both academically and occupationally, with a wide range of choices available to them.
Sex Role Orientation. Prescribed sex roles for men and women are prevalent in our society. Men are viewed as "breadwinners" or those who provide financial support for the family and work outside of the home. Women, on the other hand, are seen as homemakers or those who care for the home and the children and provide a stable and well-kept environment for the family unit. Sex-role specific personality characteristics also exist in the culture in correspondence to prescribed sex roles. For example, men are independent, aggressive and instrumental, while women are nurturant, passive and dependent. At a young age children learn sex-specific roles and personality characteristics from parents, teachers and the media.

Studies indicate that parents are influential in children's development of sex-role stereotypes. Zuckerman and Sayre (1982) found relationships between fathers' higher educational attainment and children's liberal attitudes towards women in traditional male occupations and mothers' higher educational attainment and children's liberal attitudes towards men completing household tasks. Parental background (traditional versus modern viewpoints) were related to social sex-role attitudes or sex-typed behavior of children (Minuchin, 1971). In a study conducted in four urban elementary schools of children in 4th-grade classrooms, those children from modern
backgrounds tended to have less conventional expectations and demonstrate less traditional group patterns. "These children came from families and schools where socialization toward generalized cultural standards was not the touchstone of childrearing and education and where expectations for boys and girls were not so dichotomous as in traditional environments" (Minuchin, 1971, p. 386). In a study of two groups of women (career women and homemakers) conducted by Metzler-Brennan, Lewis and Gerrard (1985), sex-typed activities (e.g., toys, activities encouraged by parents) from childhood were shown to be related to sex-typed interests and behaviors as well as adult personality characteristics of masculinity and femininity and adult role choices. Women with masculine personality characteristics tended to report more childhood masculine activities and to have both masculine and feminine aspirations.

Teachers are also influential in shaping children's sex-role beliefs. In a study conducted by Dweck, Davidson, Nelson and Enna (1978), sex differences were found in teachers' feedback to boys and girls in the classroom.

For boys, over 90% of the praise they received for their work was praise for intellectual competence; whereas for girls, significantly less of their praise (80.9%) was directed at the intellectual aspects. In
other words, almost 20% of positive evaluation girls received for their work referred to intellectually irrelevant aspects, such as neatness. (Dweck, Davidson, Nelson and Enna, 1978, p. 271)

These authors contended that both positive and negative evaluations made by teachers of boys and girls tended to promote characteristics of helplessness in girls, but not in boys. Fagot (1981) found that differential reinforcement of behavior in boys and girls was determined by the training and experience of the teacher. Feminine-preferred behaviors were responded to more frequently (over 80% of the time) by experienced teachers irrespective of student gender. In contrast, inexperienced teachers responded to feminine-preferred behaviors in girls (over 90% of the time) but responded to boys' masculine and feminine behaviors equally.

Children's literature and reading books portray males and females in stereotypic roles performing traditionally masculine and feminine behaviors (Bergman, 1974; Weitzman, Eitler, Hokada & Ross, 1972). However, preschoolers (ages 3 to 5 years) who were read both traditional and nontraditional stories of male and female workers in different types of occupations, were found to be unaffected by the nontraditional stories (Knell & Winer, 1979). The results suggest that well-established stereotypes are difficult to change by reading material
and may very well be dependent on the age of the child. These authors suspected that, "... the impact of reading content would be greatest on very young children and then show diminishing returns as children grow older and develop firmer attitudes and beliefs" (Knell & Winer, 1979, p. 86). This study also supports other research (Gettys & Cann, 1981) indicating that sex role stereotypes are established at a very young age.

The process of sex role attribution allows prevailing cultural norms to define male and female choices. Opportunities for developing a full range of skills are blocked by adherence to prescribed roles, preventing both women and men from achieving their potentials.

Along with specific roles that are stereotypic for men and women, occupations are also stereotyped according to cultural beliefs about what jobs are appropriate for men and women. Several studies have shown that sex stereotypes exist with regard to particular occupations among adults (Panek, Rush, Greenwalt, 1977; Shinar, 1975). However, a recent study conducted by White et al. (1989) indicated that occupational stereotyping may not be as robust as it once was. "Respondents rated 14 of 19 identically named occupations as significantly more gender neutral than did a similar group of Midwestern college
students sampled by Shinar in 1975" (White et al., 1989, p. 296). In the same study, however, traditionally masculine occupations (e.g., engineer, physician and architect) and traditionally feminine occupations (e.g., flight attendant, dietician, and elementary teacher) were still perceived as gender specific. Occupational stereotyping continues to occur despite some indication that college students perceptions of some occupations may be changing and becoming more gender neutral.

Occupational stereotyping has been observed and studied frequently at the college level in students making occupational and major choices. Utilizing the Holland classification system, Cook (1981) found a significant sex difference in career choices among male and female college students. Men made occupational choices within the Investigative and Enterprising categories, while women tended to choose occupations classified as Social. Similar results were found in a recent study (Gianakos & Subich, 1988) examining student sex and sex role in relation to college major choice. The results indicated that women tended to dominate in Social type majors while men tended to choose Conventional-type and Investigative-type majors. These results suggest that, "... occupational stereotyping, in the guise of major choice, remains in force in college population, particularly among
men who overwhelmingly avoid the Social-type majors" (Gianakos & Subich, 1988, p. 267). Masculine typed women (defined as women who tend to have more instrumental characteristics, such as independence, aggression, competitiveness) are frequently found in non-traditional occupations. Results of a study conducted by Wolfe and Betz (1981) found more masculine typed women (measured by FAQ) in engineering than in home economics and more feminine women in home economics than in engineering. Women who have chosen non-traditional occupations in skilled crafts, labor and technical fields tend to have nontraditional attitudes about sex roles (Stringer & Duncan, 1985). Burroughs, Turner and Turner (1984) examined sex-role contingency orientation (defined as "the extent to which life-style contingencies are salient in occupational plans" (p. 289) of college women and found that high SRCO tended to predict traditional occupations while women with intermediate or low SRCO tended to prefer innovative occupations. Career-oriented students were found to have more egalitarian sex roles (Komarovsky, 1982) while female students indicating strong career commitment tended to be masculine-typed (measured by the BEM) (Marshall & Wijting, 1980).

Children have also been shown to discriminate occupations by sex according to societal norms. Gettys and Cann
(1981) found that children as young as 2 1/2 were able to distinguish masculine and feminine occupations. Results of several studies of elementary school age children support the existence of sex differences in occupational choice of children (Frost & Diamond, 1979, MacKay & Miller, 1982; Siegel, 1973; Tremaine & Schan, 1979). In two of these studies (Frost & Diamond, 1979 and Tremaine & Schan, 1979) boys tended to avoid selecting jobs that they perceived as female-dominated while girls indicated a desire to pursue nontraditional careers. In Siegel's (1973) investigation of sex differences in the occupational choices of children in primary school grades, boys chose close to twice the number of occupations the girls chose and girls choices were within a narrower range of occupations than those of the boys. For example, out of 29 girls, 20 chose either "teacher" or "nurse" while the boys' choices revealed no more than 3 boys in any one single category. In this same study boys and girls did not choose any of the same occupations. Similarly, Nelson (1978) found the boys at the preschool and 3rd grade levels mentioned a larger number of occupational roles than was mentioned by the girls.

Perhaps the best example of the pervasiveness of occupational stereotyping among children is a study conducted by Drabman, et al. (1981). In this experiment
children (1st, 4th and 6th graders) were shown a brief videotape depicting a male nurse and a female doctor with corresponding gender enforced names of "David Gregory" and "Mary Nancy". When asked the names of the nurse and the doctor following the videotape, the first graders and the fourth graders chose stereotyped gender names for both. The seventh-graders, who were tested immediately, were able to accurately name the doctor and the nurse. However, when the 7th graders were tested one week later, they were unable to choose significantly the correct gender names for the occupations. These results point to the strength and durability of learned occupational sex stereotypes to the extent that children actually alter their perception of a real situation (as presented in the videotape) to correspond to previous knowledge of occupational stereotypes. Further, with regard to the 7th graders change in perception of gender names within a weeks time suggests that sex-role stereotyping can effect "long-term memory storage of sex-role information" (Drabman et al., 1981, p. 387).

Sex role socialization influences not only occupational stereotyping but also the development of "sex-specific" personality characteristics in women and men. Masculine or "instrumental" personality characteristics have typically been associated with males while feminine or
"expressive" personality characteristics have been associated with females.

There are numerous studies in the literature that point to instrumental personality characteristics in relation to career-oriented women and in particular, to women choosing male-dominated or nontraditional occupations. In early studies, Rand (1968) found that career-oriented college women were similar to college men by exhibiting certain "masculine characteristics" and Tangri (1972) found that role innovators (when compared to traditionals) were more autonomous, individualistic and internally motivated to perform to capacity. In a review of personality characteristics of women in male-dominated occupations or those pursuing advanced degrees in male-dominated occupations or those pursuing advanced degrees in male-dominated fields, Lemkau (1979) reported a trend in the literature. The majority of studies reviewed indicated the importance of competency traits (typically associated with men) -- independence, assertiveness, rationality, etc. However, in 1983, Lemkau compared equally educated women employed in male and female-dominated professions and found no difference between the two groups on competency traits. These results suggest that the cluster of competency traits are important for women's career success regardless of the field she pursues. This finding
is supported by other studies (Bardwick, 1971; Spence & Helmreich, 1978; Wong, Kettlewell & Sproule, 1985) that point to the importance of agentic traits, such as assertiveness, instrumentality and mastery, in order to achieve success. These instrumental personality characteristics were also found to be important in women who continue or plan to work after having children (Gaddy, Glass & Arnoff, 1983; Greenglass & Devins, 1982) and an important aspect of overall psychological well-being (Whitley, 1984).

**Self-Esteem.** Self-esteem has been found to influence women's career development, especially in relation to ability and achievement. Stake (1979) developed an instrument (Performance-Self-Esteem Scale) designed to measure a variety of self evaluations specifically related to ability and performance. In a study utilizing this measure, women tended to have lower evaluations of their abilities and performance in a number of different achievement settings when compared to men.

Self-esteem has also been associated with career orientation in women. Tinsley and Faunce (1980) found that career-oriented women had more positive personal and academic self-concepts compared to homemaker-oriented women. Similarly, several studies (Bachtold, 1976;
Bachtold & Werner, 1970 & Cartwright, 1978) indicated greater self-confidence and higher levels of self-esteem among successful academic women (psychologists, scientists, artists, writers and politicians) and professional women (physicians). Lemkau (1983) compared equally educated career-oriented women in sex-atypical fields (i.e., accounting, architecture, engineering, chemistry) to those in sex-typical fields (i.e., library science, nursing, speech pathology, elementary teaching) and found both groups of women to be slightly more self-assured than women in general. Baruch (1976) reported a correlation between high self-esteem, feelings of competence and high career aspirations among adolescent girls.

There also appears to be a relationship between instrumental personality characteristics and high self-esteem. Antill and Cunningham (1979) examined the relationship between self-esteem and masculine and feminine characteristics. In both male and female college students' self-descriptions that included "masculine characteristics" were associated with high levels of self-esteem, while "feminine characteristics" had no impact on males' self-esteem. In another study conducted on college students, Stericker and Johnson (1977) found achievement motivation and a stereotypically more masculine sex-role
identification were positively related to self-esteem for both males and females.

Research indicates the importance of self-esteem in women's career development due to its relationship to ability and achievement, career orientation and instrumental personality characteristics.

Marital and Parental Status. Perhaps the most important issue confronting women today as they make major and occupational choices is the influence of marriage and childbearing. In 1972, Rand and Miller found that the majority of women in junior high school, high school and college planned to combine career, marriage and motherhood. However, these plans were not without conflict. As early as 1964, Matthews and Tiedeman reported that young women in their study experienced conflict between career and marital responsibilities. Richardson (1974) contended that role conflict creates anxiety for women preventing them from committing themselves to a particular occupation. Tittle (1982) factor analyzed three sets of values for females in relation to the adult roles of worker, marriage partner and parent and found "... that values held for the three adult roles were (sic) linked in the perceptions of female student" (p. 156). Even among female Ph.D. recipients,
the conflict between home and career is present. Leviton and Whitely (1981) examined sex differences among female and male Ph.D. recipients in terms of job seeking, job attainment and factors influencing career advancement. Women rated both home and career values more highly than men and reported more conflicts in pursuing a career. For women, occupational decisions are contingent on decisions made about marriage and children.

The literature on the career development of women consistently indicates a relationship between career oriented women and low marriage rates. Of those women who received Ph.D.s in 1957 and 1958, approximately 50% of them were or had been married compared to 94% of women in the same age group in the general population (Merritt, 1976). Wolfson (1976) found that women categorized as highly career-committed (or those pursuing the high-moderate and unusual career patterns) tended to be unmarried. Gigy (1980) reported a relationship between a self-concept involving independence and self-determination and the choice among women not to marry. These factors were also found to influence the amount of education and type of career women pursue. Other studies (Greenglass & Devins, 1982; Harmon, 1970) indicated that women with greater commitment to careers often delayed marriage.
Similarly, these same women tended to have fewer children. Merritt (1976) found that women holding doctorates had smaller families than the national average while Harmon (1970) reported that career-committed women bore fewer children compared to non-committed women. Greenglass and Devins (1982) found that 88% of the women who indicated that a career was important, also indicated a desire to have children. However, the more committed a woman was to a career, the more likely she was to delay plans for children.

Clearly, marriage and children present a conflict to women not only in occupational decision-making but also in determining how to balance multiple roles. Division of labor in marriages is a popular issue that has received a great deal of attention. Atkinson and Huston (1984) examined division of labor by newlyweds and included participation in the labor force versus participation in household work. Consistent with previous research on this issue, in this study women completed from 50-75% of the household tasks, significantly more than men. Even though women are entering the labor force in larger numbers than ever before, traditional values prevail at home where women continue to perform the majority of household activities. Marital disruption (i.e., divorce, widowhood, previous divorces among the currently married) has also
been reported to be more prevalent among women with five or more years of postsecondary education (Houseknecht & Spanier, 1980).

Research utilizing individual variables reviewed in the previous section have been important in the study of women's career development. These studies have established a knowledge base in the field of vocational psychology on women's career behavior that did not exist twenty-five years ago. This research has also provided support for the contention that the career development process is different and more complex for women than it is for men. Several researchers (Farmer, 1985; Astin, 1984; Betz & Fitzgerald, 1987, tested by Fassinger, 1985, 1990) have taken steps to further advance the theory of women's career development by proposing comprehensive models that allow for the integration of variables. Although these models have significantly added to women's career development theory by providing innovative, multidimensional formulations, there is not yet a model that can adequately explain the vocational behavior of women (Betz & Fitzgerald, 1987).

Another approach in advancing the theory of women's career development may be to utilize multiple variables with a sample of women who have chosen to pursue a particular
occupational field. Previous studies have employed samples drawn from large groups of women, typically those enrolled at different levels of high school (Farmer, 1985) or college (Fassinger, 1985, 1990). Women included in these studies express interests in and intentions of going into a variety of occupational fields. Such a broad approach may add to the complexity of the models without allowing for clear identification of pertinent factors. A sample consisting of women with similar occupational interests may provide a more unified approach to theory development and lend support to the idea that there is not one comprehensive model that can be used to explain the career development of all women. Multiple models may be determined by studying women in terms of occupational field of interest. For example, a career development model describing women who intend to go into education would look different than a model describing women who intend to go into business. A third model may exist for women planning on careers in pharmacy, etc.

This study will approach the career development of women by utilizing a sample of women who are interested in teaching. Therefore, the literature on the career choice of teachers will also be included in this review.
Career Development of Teachers

According to national estimates (Carnegie Foundation for the Advancement of Teaching, 1987; 1986), the demand for teachers between 1990 and 1993 will be over 200,000 each year. There are needs for teachers in special education, mathematics and science and for bilingual education instructors. Given these estimated needs for teachers, it is uncertain whether there will be an adequate supply of teachers to fill openings. It has been estimated that if there is no change in the number of college graduates going into teaching, only 63% of these new teaching positions in 1993 will be met by new teacher graduates. For a variety of reasons, the interest in teaching for males and females has declined in recent years. Data indicates that the percentage of freshmen (men and women) intending to major in education decreased from 19% in 1970 to just 7% in 1985. Information on women's occupational choice alone also reveals a drop in those who plan to teach. In the early 1970's approximately 1/3 of freshmen women chose the teaching profession and in 1985 only 10% were interested in pursuing a career in education. According to the Carnegie Foundation for the Advancement of Teaching (1986), "Dissatisfaction with low salaries, poor working conditions and the fact that women have more
career options all contribute to America's declining supply of teachers" (p. 28). Despite these obstacles there is a strong push among educators and policy makers to attract and retain good teachers.

Much of the literature on teachers and the teaching profession in the last ten years has focused on the finding that individuals who choose to become teachers have below average academic ability compared to others choosing different fields of study (Atkin, 1981; Carnegie Foundation for the Advancement of Teaching, 1986; Lyons, 1980; National Commission on Excellence in Education, 1983; Pavalko, 1970; Roberson, Keith & Page, 1983; Schlechty & Vance, 1981; Vance & Schlechty, 1982; Weaver, 1979). One study that is frequently used to point out the poor academic ability of those who intended to teach was conducted by Savage (1983). In this study two different measures (SAT composite scores and High School ranking by quarter) were used as criterion of academic qualifications. The results indicated that out of seven academic fields included in the study, women in elementary education ranked sixth. Only students in physical education had a lower composite score. When high school rankings by quarter were examined for these groups, women in elementary education tied for last place along with students in liberal arts. However, not all studies report
negative findings. In this same study (Savage, 1983) when percentile ranges were evaluated, the data indicated that the top 60-75% of women in elementary education could be successful in other fields of study based on their academic abilities. More importantly, the Carnegie Foundation for the Advancement of Teaching (1986) found improvement in high school achievement of those indicating a desire to teach when data from 1975 and 1984 was compared. In a recent study conducted by Book, Freeman and Brousseau (1985) prospective teachers were compared with non-teachers (students enrolled in a communications class and representing a variety of academic areas). Results of the study indicated that there were no significant differences between the two groups with regard to academic preparation and academic potential. In Andrew's (1983) study of students enrolled in a 5-year teaching program at University of New Hampshire, students had good academic records and abilities. The average GPA over an eight year time period was 3.1 and the average combined GRE scores was 1029. In addition, approximately 40% of individuals admitted to the 5-year program were honor students at the undergraduate level. While there appears to be several recent studies pointing to a positive change in academic ability among students pursuing an education degree, there is enough substantial evidence in the opposite direction to conclude that the
teaching profession continues to attract individuals who are less academically able than those in other fields of study.

Since the turn of the century school teaching at both the elementary and secondary levels has been a profession dominated by women. Teaching was seen as more attractive for women than for men due to the correspondence between the socialization of girls (emphasizing interpersonal skills and service) and the types of skills that are necessary for the job as teacher and the perceived fit between a teacher's work schedule and the traditional roles of wife and mother (Havighurst & Levine, 1979). Despite the fact that in recent years there has been a decline in the number of women who plan to teach, the teaching profession, especially at the elementary level, continues to be dominated by white females. In 1985, women were awarded 76% of the baccalaureate degrees in education. A survey of entry level education classes conducted between 1981-1982 indicated that traditional stereotypes of the occupation of teacher prevail (Book, Byers & Freeman, 1983). In this survey, 94% of the education students were Caucasian and 79% were female. Book, Freeman and Brousseau (1985) found similar results in their comparison study of teachers and non-teachers. Teachers were more likely to be female (75% versus 56%)
and were more likely to be Caucasian (98 versus 87%).
Roberson, Keith and Page (1983) performed a path analysis
to determine the importance of background variables,
attitudes and perceived motivations on occupational
aspirations of high school seniors who intended to teach
compared to those who did not. Results indicated that the
strongest path was gender. In this study the majority of
those choosing a career in teaching were female.

Two other background variables that are significant in
examining characteristics of prospective teachers are
socioeconomic status and place of residence. Weaver
(1979) evaluated data collected by the College Entrance
Examination Board and found that that majority of teacher
education candidates came from families with incomes that
are average or below average. Similarly, when education
and non-education majors were compared, Book, Freeman and
Brousseau (1985) found a larger number of non-education
majors were from families whose combined income was more
than $50,000. Place of residence is also an important
factor in examining the social background of teachers.
Teaching as a career goal among young people in rural
areas of Norway, Germany and the United States was the
focus of a large study conducted by Schwarzweller and
Lyson (1978). These researchers found that the majority
of rural young people in all three societies chose
teaching as a career goal. This finding was especially true for American girls. Over 80% of girls who intended to pursue professional careers indicated a desire to teach. Schwarzweller and Lyson (1978) contended that "... in rural America and in certain respects also in rural Europe, a career in teaching represents an important means by which lower status youths and girls in general can enhance their lot in life and hope to achieve a modest degree of upward social mobility" (p. 42). Using a United States sample (National Longitudinal Study High School class of 1972) only, Falk, Falkowski and Lyson (1981) found similar results but do not believe that their findings are as important as the Schwarzveller-Lyson data suggest. Falk, Falkowski and Lyson (1981) indicated that teaching may be losing its popularity, especially for blacks and women. In examining national data, Yarger, Howey and Joyce (1977) indicated that the average teacher education student tended to come from a small city or rural area. In a more recent study Lyson and Falk (1984) found that at the high school level, women, nonwhites, rural residents and individuals from lower social class origins found the teaching profession to be an attractive career option. Pavalko (1970) found that community size had more to do with the retention of teachers than with the recruitment of teachers. Teachers from smaller communities tended to persist in the teaching profession.
Among the factors influencing teacher choice, a "liking for children" or an "interest in children" has been the most popular and consistent finding in studies that span the last three decades (Book, Freeman & Brousseau, 1985; Fox, 1961; Haubrich, 1960; Lortie, 1975; Richards, 1960; Roberson, Keith & Page, 1983; Saxe, 1969). Again this is a consistent and durable finding that has emerged in studies from the early 60's into the 80's. Students in Book, Byers and Freeman's (1983) study were particularly influenced by traditional role models. Women whose mothers were homemakers were three times as likely to report they would leave teaching to raise a family compared to women whose mothers were employed as either professionals or non-professionals. "It appears that for these students traditional female role models may have a continuing and powerful effect on influencing career aspirations" (Book, Byers & Freeman, 1983, p. 10).

The literature suggests that individuals who are attracted to the field of education tend to be white females from lower middle class to middle class families of origin and rural or small city place of residence. Women's choice to pursue a career in education has frequently been influenced by former teachers and by reasons that generally include both "a liking for children" and "a desire to help others". When compared to individuals
choosing other fields of study, those in education tend to have lower academic abilities.

While these findings are consistent and appear to be valid, there is a need for updated knowledge on the career choice of teaching. Schaloch (1979) contends that, "Teaching as an occupational choice is a neglected aspect of research on teacher selection, and needs to be pursued" (p. 367). This is not the first time that this need has been voiced. In 1973, Lortie stated that, "... we know next to nothing about the flow of people into teaching" (p. 486) which led to his book School Teacher: A Sociological Study being published two years later in 1975. However, that was over 15 years ago and since that time, little has been added to the understanding of individuals choosing teaching as a career. Current data is unclear and often misleading, especially with respect to teachers' academic ability. While there have been numerous studies indicating the below average ability of our nation's teachers, the majority of these studies were done on high school or college students who plan to teach, not on individuals employed as teachers. Initial choices made in high school or college are often unrealistic and do not always lead to occupational attainment. Lyson and Falk (1984) found in their study of high school seniors that 75% of the students who indicated teaching as their
occupational choice were not teaching 7 years later. While the evidence points to the fact that individuals with below average academic abilities are attracted to teaching, it is not clear whether the same statement can be made about individuals actually teaching.

One effort to improve upon existing research is Bethune's (1981) dissertation on female college students' major choice of education which focuses on the nature and characteristics of individuals attracted to education during college. A causal model was utilized to determine the individual characteristics and social contexts that influence students' major choice of education. Results indicated that,

...the field continues to attract white females who are less able, with poorer records of performance, more modest social backgrounds, from more rural areas, and in less selective colleges than white females choosing other fields, and being of lower ability and in less selective colleges are the strongest predictors of majoring in the field. (Bethune, 1981, p. 127)

Similar to previous studies, these results need to be interpreted with caution emphasizing the difference
between individuals attracted to the field of education versus those who are actually teaching.
Chapter III

Research Methodology

Introduction

This chapter describes the research methodology utilized in the study and includes the following topics: 1) research setting and population, 2) subjects, 3) procedures used in carrying out the study, 4) instruments, and 5) analysis of data.

Research Setting and Population

This study utilized data that were collected during the winter and spring quarters of 1990 at The Ohio State University, Columbus campus. All female students enrolled in the Freshman Early Experience Program (FEEP) during these two quarters were included in the study. FEEP is a course offered each quarter (autumn, winter and spring) by the College of Education, Department of Educational Services and Research in cooperation with six central Ohio
school districts. Participating school districts include Columbus, Hilliard, Southwest, Upper Arlington, Worthington and Whitehall.

The overall purpose of FEEP is twofold: 1) students are provided the opportunity to experience teaching as an occupation and as a result, 2) students are able to make informed and realistic decisions about pursuing teaching as a career. Students are placed in a school setting (elementary, middle, or high school) and are assigned to work with a classroom teacher. Students learn mainly through observation but may also be involved in tutoring or planning and presenting lessons. The objective of the classroom experience is for students to understand all aspects of the teacher's role. The field experience portion of the course is sixteen hours a week (four, half days a week) and is graded satisfactory/unsatisfactory.

Students also attend a two and one-half hour seminar once a week as part of FEEP. The focus of the seminar is on the career and personal development of prospective teachers. Seminar objectives include the acquisition of knowledge and skills important to the helping professions. Topics pertaining to the teacher role and the teaching profession are discussed in relation to participants' self-exploration and understanding of self. Students
receive a letter grade (A-E) for the seminar portion of FEEP.

The typical profile of a FEEP participant is a white, sophomore or junior female college student, interested in teaching at the elementary school level. (Approximately 70% of FEEP students are interested in elementary education).

Subjects

Subjects for this study included 286 female students enrolled in FEEP during winter and spring quarters, 1990. Subjects were grouped according to interest in teaching at the elementary level (K-5) (N=219) or at the secondary level (6-12) (N=67). Males were not included in the study due to the relatively small number of males enrolled in FEEP (approximately 80% of the sample is female) and the focus of the study (on the career development of women). In addition, in the sample of 286 female students enrolled in FEEP during winter and spring quarters, 1990, African American women were not represented. Therefore, subjects for this study included only white female students.
Procedures

During the course of each quarter (winter and spring, 1990), FEEP students completed several different instruments and inventories. This study utilized the results from the following inventories: 1) BEM Inventory, 2) California Psychological Inventory Self-Acceptance Scale, 3) Attitude Questionnaire, and 4) The FEEP Questionnaire.

The following procedural steps were taken in collecting the data for the study.

1) Written information and instructions for administering the instruments and inventories for this study were given to five FEEP seminar leaders by the researcher prior to the distribution and administration of inventories. The information and instructions were explained and reviewed in person with the Administrative Assistant for FEEP (a doctoral level graduate student). The researcher maintained weekly contact with the Administrative Assistant to answer questions proposed by seminar leaders regarding procedures for distribution of packets and administration of inventories.
2) Packets containing the different instruments and inventories were distributed to subjects during the initial FEEP orientation sessions, at the beginning of each quarter. The inventories utilized in this research included the following:

a) BEM Inventory

b) California Psychological Inventory
   Self-Acceptance Scale

c) Attitude Questionnaire

3) Individual identification numbers were assigned to subjects and were written on the outside of the packets as well as on all the instruments and inventories in order to preserve confidentiality. Neither subject names nor social security numbers were utilized.

4) Subjects were given the following information (verbally) by seminar leaders regarding the completion of the instruments and inventories in the initial FEEP orientation session.

a) Completion of the instruments and inventories is a requirement for the FEEP seminar and is 10% of
the evaluation criteria utilized for grading. This information is stated on the FEEP seminar course syllabus.

b) While the completion of the inventories is considered in the final grade for the FEEP seminar, subjects' responses are confidential and will not (under any circumstances) be used for evaluation purposes by the FEEP staff or the College of Education.

c) The purpose of administering and interpreting these inventories is: 1) to provide FEEP participants with the opportunity to receive self-information utilized in evaluating themselves as future teachers and 2) to assist in revising curriculum for FEEP and in understanding personal and environmental factors that contribute to pre-service teachers' career choice.

d) Further interpretation of the instruments and inventories (beyond the classroom interpretation) can be scheduled, on an individual basis.
5) Subjects were instructed by seminar leaders to complete the instruments and inventories contained in the packets at home and return them at the next seminar meeting (the following week).

6) The FEEP questionnaire was completed by subjects during the final seminar meeting of the quarter due to the interest in subjects' reactions to the FEEP experience.

**Instruments**

This section describes the indicators which were used to measure six predictor variables postulated to affect career choice.

1) **Academic Achievement** was measured by the student's college grade point average which was obtained from the FEEP questionnaire. Grade point averages were recorded at the time subjects were enrolled in FEEP (winter and spring quarters, 1990) and were verified using university systems database.

According to Academic Standards for The Ohio State University, The University Grading System is based on a point-hour ratio scale. This ratio is determined
by dividing the total number of points earned by the total number of credit hours attempted. Graded courses are computed according to the following scale: A=4.00, A-=3.70, B+=3.30, B=3.00, B-=2.70, C+=2.30, C=2.00, C-=1.70, D+=1.30, D=1.00, and E=0.00. (There is no A+, D- or E+.) The Ohio State University's current plus and minus grading system was effective Winter quarter, 1978. (The Ohio State University Office of Academic Affairs, 1990).

2) **Mathematics Ability** was measured by the subject's ACT/SAT mathematics score which was obtained from the FEEP questionnaire and verified on the university systems database. Where SAT scores were reported instead of ACT scores, SAT/ACT score equivalents were used to convert SAT scores to ACT scores. Equivalency tables for the SAT/ACT mathematics scores were obtained from ACT (see Appendix A: ACT: Mathematics Score Equivalents of SAT: Math Scores). ACT/SAT score equivalents were derived by examining the relationship between SAT Total, Verbal and Mathematics scores and the former ACT Assessment Composite, English and Mathematics scores in research conducted at the University of Illinois (Langston, University of Illinois, 1987). The following limitations must be taken into consideration in
a) SAT and ACT do not measure the same psychological constructs. ACT Assessment tests are curriculum-based tests of educational development, while the SAT measures general verbal and quantitative aptitudes. As a result of these differences in content, there can be different definitions of equivalent performance on the two tests.

b) The equivalency table derived from this study can vary depending upon the population and institution.

c) The concordance tables cannot be used with Enhanced ACT scores (from October 1989 and later test dates). M. Gillespie (personal communication, June 10, 1991). Note: All subjects in this study completed ACT testing prior to October, 1989.

3) Sex-Role Orientation was measured by the Bem Sex-Role Inventory (BSRI) (Bem, 1978). This instrument is a self-report inventory designed to measure sex-role attitudes or more specifically, the extent to which an individual identifies with masculine and feminine
characteristics (Bem, 1974). The BSRI consists of 20 masculine, 20 feminine and 20 neutral personality characteristics. Subjects indicate on a 7-point scale, that ranges from "never" or "almost never true" to "always" or "almost always true", how true each of the personality characteristics are of themselves. Separate masculine and feminine mean scores are computed and utilized to determine sex-role identity. Both masculine and feminine scores are independent and can range from 1 to 7. An androgynous score is a measure of how much an individual endorses both masculine and feminine characteristics. The more balanced an individual's self-description, the more the person is androgynous. A median split technique was utilized to categorize subjects according to a fourfold classification system that consists of feminine (high feminine-low masculine), masculine (high masculine-low feminine), androgynous (high masculine-high feminine), and undifferentiated (low masculine-low feminine). Medians for this study were based on the 1978 normative sample of Stanford University students (sexes combined) (Bem, 1981): Femininity - 4.9, Masculinity - 4.95. The median-split method of scoring utilized in this study has been endorsed by Spence and Helmreich (1979) and is outlined in the
BSRI professional manual (Bem, 1981).

The Bern Sex-Role Inventory was normed on two separate samples of college students (Bem, 1981). Internal consistency of the BSRI was estimated using coefficient alpha for the Masculinity, Femininity and Social Desirability scores. The results indicated that all three scores were highly reliable: Masculinity $a = .86$ in both samples, Femininity $a = .80$ and .82, and Social Desirability $a = .75$ and .70. Product-moment correlations were computed in order to determine test-retest reliability over a four week interval. Results indicated a high test-retest reliability: Masculinity $r = .90$, Androgyny $r = .93$, Social Desirability $r = .89$.

4) Self-Esteem was measured by the Self-Acceptance scale on the California Psychological Inventory (CPI) (Gough, 1986). This inventory is a self-report instrument comprised of 20 scales (462 items) and is designed "...to assess the kind of everyday variables that ordinary people used in their daily lives to understand, classify and predict their own behavior and that of others" (Gough, 1987, p. 1). The set of scales represents a broad range of concepts that arise from interpersonal life. Examples of scales
include Dominance, Capacity for Status, Sociability, Social Presence, Self-Acceptance, Independence, Empathy, Achievement and Responsibility. According to Gough (1987) the inventory can be administered in its entirety or a single scale can be used in providing explication and prediction of specific interpersonal behaviors. For purposes of this study, only the Self-Acceptance scale was administered.

The Self-Acceptance scale consists of 28 items or statements (Gough, 1987). The subject is instructed to read each statement and decide how they feel about it. If they agree with the statement or feel it is true about them, they respond by answering true. If they disagree with the statement or feel it is not true about them, they respond by answering false. A raw score is obtained by adding the number of answers agreeing with the designated responses on the template. Higher scores indicate that the individual has a good opinion of him/herself and sees self as talented and as personally attractive. Lower scores indicate that the individual is self-doubting, readily assumes blame when things go wrong and often thinks others are better.

The inventory utilizes standard scores with means for each scale set at 50 and standard deviations at 10
(Gough, 1987). The internal consistency (alpha) correlations were computed in samples of 200 college males and 200 college females as well as on the combined sample for 400 students. The alpha coefficients for the total sample ranged from .52 for Self-Acceptance to .85 for v.3 (Self-Realization). The range for the female sample was from a low of .39 for F/M (Femininity/Masculinity) to a high of .83 for v.3 (Self-Realization). The alpha coefficient for the female sample on the Self-Acceptance scale was moderately reliable (a=.55). Test-retest correlations were estimated for high school students tested first in the eleventh grade and then a year later in the twelfth grade. Results for the Self-Acceptance scale indicate a .74 correlation for the female sample.

5) Career Orientation is a single question that asks subjects to select one out of six career patterns that they will most likely follow. Items include: "No paid employment after school completion", "Full or part-time employment after school completion for a few years then no further employment", "Full-time paid employment after school completion followed by a period of non-employment and then a return to part-time paid employment", "Full-time paid employment
after school completion followed by a period of non-employment and then a return to full-time paid employment", "Full-time paid employment after school completion followed by a period of part-time employment and then a return to full-time paid employment" and "Continuous full-time paid employment from school completion to retirement" (See Appendix B). Scores for this indicator ranged from 1 to 6, with higher scores indicating more commitment to future career plans.

Several researchers (Edwards, 1969; Fassinger, 1990; Marshall & Wijting, 1980; Richardson, 1974) have successfully used this question (or a variation of this question) to measure future life plans and career patterns in studies of women's career development. In an early study conducted by Edwards (1969), female nursing and education students were asked to indicate their preference for one of five life plans, ranging from marriage and a family without career involvement to work (or study) in their profession more or less continuously with some limitation on family involvement. The majority of teachers (64%) as well as nurses (52%) chose a compromise plan that involved working or studying in their profession, marriage, time off to raise
children and returning to work after the children are older. Marshall and Wijting (1980) adapted Edwards's (1969) life plans question as an indicator of the extent to which work figures into actual future plans. This was one of seven career orientation measures in a study that examined the relationships of achievement motivation and sex-role identity to career orientation among college women.

Richardson (1974) examined fourteen possible career orientation variables in an attempt to establish a clear definition of the construct, career orientation. In her study, she utilized a single question (similar to Edward's (1969) life plans question) as an indicator of the extent of work in subjects' life plans. Life plan preferences ranged from exclusive involvement in home and family responsibilities to total commitment to career. Results of this study revealed the emergence of two modal orientations: career-oriented versus work-oriented women. Those women in the former category preferred a life plan devoted to career pursuits while those women in the latter category preferred involvement in both family and career pursuits. In addition, work-oriented women tended to choose more traditional occupations in order to integrate these
two aspects in their life plans. Similarly, Fassinger (1990) utilized a single question measuring career plans as an indicator of career orientation. Respondents were asked to choose one of six life plans and career patterns that resembled their own (e.g., "Continuous full-time paid employment from school completion to retirement"). Fassinger (1990) found that high levels of career orientation among college women were predicted by high ability (achievement-related variables), liberal sex role attitudes, and instrumental personality tendencies.

6) **Importance of Career-Family** is a single question indicating the degree to which the subject values career versus family pursuits. Subjects were asked to select one out of five statements that was closest to their feelings regarding the relative importance of career and family. Items include: "Career pursuits are far more important than family pursuits", "Career pursuits are more important than family pursuits but family is important too", "Career and family pursuits are equally important", "Family pursuits are more important than career pursuits but career is important too" and "Family pursuits are far more important than career pursuits" (See Appendix B). Total scores range from 1 to 5 with higher
scores indicating that the subject places greater importance on family pursuits.

While psychometric information does not exist for this item, both Richardson (1974) and Fassinger (1990) successfully used this indicator in research on women's career development. In a study designed to clarify the meaning of the construct, career orientation, Richardson (1974) utilized a variable she titled the "Importance of Career and Marriage". The measure indicates the relative importance of career versus marriage. In her study, this measure was found to differentiate career-oriented women (those who established long-term career goals as central in their future plans) from work-oriented women (those who integrated career and family roles) and was found to be related to traditionality of career choice. Fassinger (1990) utilized a modified version of Richardson's (1974) measure as an indicator of Family Orientation in her study on the career development of women. Although the basic construct of the measure remained the same, the importance of family was used (instead of marriage) in relation to the importance of career.
This study utilized a correlational research design due to the researcher's interest in analyzing how several predictor variables affect the traditional career choices of college women. Logistic regression, a type of regression analysis, was chosen for this study because it allows for categorical outcome variables and any mix of numerical and categorical regressors. Similar to any model-building technique used in statistics, the main objective of the logistic regression is to find the best fitting model to describe the relationship between an outcome or dependent variable and a set of independent or predictor variables. In this study several predictor variables were selected based on research that provided evidence of their importance in the career development of women. These variables included: academic achievement (GPA), mathematics ability (ACTMATH), self-esteem (SAS), sex-role orientation (BEM), career orientation (CAP), and family-career importance (FCI). The dichotomous dependent (outcome) variable for the study is elementary teaching and secondary teaching. Although the logistic regression model is not a common statistical analysis in the social sciences, in the last ten years it has become a standard method for regression analysis of dichotomous data in a
number of areas, especially in the health sciences (Hosmer & Lemeshow, 1989).

A Stepwise Logistic Regression available on BMDP (BMDP Statistical Software, Inc., 1990) was chosen for this analysis due to its ability to generate design variables for categorical independent variables and its versatility in providing a complete and effective data analysis tool. The following steps were taken in analyzing the data: 1) Selection of variables, 2) Model building and assessing the fit of the model and 3) Interpretation of the coefficients. Stepwise logistic regression has been criticized as being too mechanical, thereby potentially yielding an implausible model (Greenland, 1989) and for selecting irrelevant variables (Flack & Chang, 1987). As a check to ensure the accuracy of the stepwise logistic regression procedure in the selection of variables, univariate logistic regressions were run for each of the six variables included in the study prior to running the stepwise logistic regression. Results of this approach were compared to the stepwise procedure.

Selection of variables. The six variables of interest (G.P.A., mathematics ability, self-esteem, sex-role orientation, career orientation and family versus career importance) are entered into the stepwise logistic
regression procedure at the initial step of the logistic regression procedure and p-values are generated for each variable. The most important variable is the one with the smallest p-value and this variable is entered first in the model. At each step of the process p-values are calculated controlling for the variable(s) previously entered in the model. Stepping stops when the p-values for the remaining variables to enter exceed p=.15. At each step the model includes a check for backward elimination (variables added in previous steps can be deleted if p-values exceed .20).

Model building and assessing the fit of the model. As the stepwise logistic regression procedure continues to select or reject variables, a model is built containing those variables that added significantly to the fit of the model. At each step in the stepping process, logistic regression provides several statistics to assess the fit of the model: the log-likelihood (which measures the consistency between the data and the model), the change in the log-likelihood since the previous step, and the evaluations of the model using three goodness-of-fit $\chi^2$ statistics.
Interpretation of the coefficients. After the logistic regression model has been fit to the data, the last step is to interpret the estimated coefficients for the independent variables in the model. Two useful test statistics were utilized in interpreting the coefficients in the model: the Wald statistic and the odds ratio. The Wald test statistic (coefficient/standard error) indicates whether a particular variable is significant (values < 2.0 are deemed not significant). The odds ratio is a measure of association between the dependent variable and the independent variable.

In summary, the following steps were taken in analyzing the data for this study: 1) selection of variables, 2) model-building and assessing the fit of the model, and 3) interpretation of the coefficients. These procedures provided a thorough method for ensuring an adequate fit of the model to the data and accuracy in interpreting the coefficients.
Chapter IV

Results

The first section of this chapter includes background data describing the two samples of college women utilized in the predictive study. Profile information includes mean ages and class status as well as means or frequency data for the six variables of interest in the study (GPA, BEM ACTMATH, SAS, CAP and FCI).

Descriptive Statistics

Table 1 presents mean ages and class status for both the elementary teaching (N=219) and secondary teaching (N=67) samples. As Table 1 indicates, these samples demonstrate several background similarities and differences. The mean ages for the samples are 19.2 for the elementary teaching sample and 19.3 for the secondary teaching sample. Differences were found in class status. Although the majority of subjects in both samples were freshmen (68.9%
of the elementary teaching sample and 53.7% of the secondary teaching sample, the secondary teaching sample had larger percentages of subjects at the sophomore and junior levels than the elementary teaching sample. The elementary teaching sample consisted of 25.6% sophomores while 35.8% of the secondary teaching sample were sophomores. Similarly only 5% of the elementary teaching sample were juniors while 10.4% of the secondary teaching sample had achieved junior status.

Table 1. Background Information for Elementary Teaching and Secondary Teaching Samples

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<th>Elementary</th>
<th>Secondary</th>
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<td>Mean Age</td>
<td>19.2</td>
<td>19.3</td>
</tr>
<tr>
<td>Class Rank (in %)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 (Freshmen)</td>
<td>68.9</td>
<td>53.7</td>
</tr>
<tr>
<td>2 (Sophomore)</td>
<td>25.6</td>
<td>35.8</td>
</tr>
<tr>
<td>3 (Junior)</td>
<td>5.0</td>
<td>10.4</td>
</tr>
<tr>
<td>4 (Senior)</td>
<td>0.5</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Table 2 presents the means and standard deviations for three of the six variables (GPA, ACTMATH, and SAS) used in
the data analysis for the elementary teaching sample, the secondary teaching sample and combined samples. As the table illustrates, both samples are similar academically, indicated by mean GPA and ACTMATH scores. Mean GPAs for both samples are above average with the secondary teaching sample mean (M=2.78) slightly higher than the elementary teaching sample mean (M=2.68). Mean ACTMATH scores for both samples are above average (M=18.25, 18.79) when compared to national averages but are below average in comparison to The Ohio State University student population. (Approximate mean ACT Math score of (1988-89) college-bound students was 17.1 (National Center for Education Statistics, 1991) and the average Act Math score of incoming freshmen at The Ohio State University (1989-90 academic year) was 20.3). M. Garner (personal communication, October, 11, 1991).

Mean scores of 19.10 and 19.78 on a measure of self-acceptance (SAS) indicated average levels of self-esteem for both samples when compared to both a normative sample of females (N=1000) (M=17.54, SD=3.50) and a normative sample of college females in education (N=310) (M=20.18, SD=3.02).

Table 3 presents frequencies (in percent) for the sex role orientation (BEM) variable for the elementary teaching and
Table 2. Means and Standard Deviations for GPA, ACTMATH and SAS for the Elementary Teaching, Secondary Teaching and Combined Samples

<table>
<thead>
<tr>
<th>Variable</th>
<th>Score Range</th>
<th>Elementary</th>
<th>Secondary</th>
<th>Combined</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>GPA</td>
<td>1.00-3.89</td>
<td>2.68</td>
<td>.53</td>
<td>2.78</td>
</tr>
<tr>
<td>ACTMATH</td>
<td>0-29</td>
<td>18.25</td>
<td>5.76</td>
<td>18.79</td>
</tr>
<tr>
<td>SAS</td>
<td>4-26</td>
<td>19.10</td>
<td>3.22</td>
<td>19.73</td>
</tr>
</tbody>
</table>

N: Elementary Teaching=219 Secondary Teaching=67 Combined=286

Where SAT Math scores (in place of ACT) were reported, they were converted to ACT Math scores using the table in Appendix A.
secondary teaching samples. The table shows the percentage of subjects in each of the two samples that fall into each of four different categories (feminine, masculine, androgynous or undifferentiated). The percentages indicated differences in sex role orientation, especially in examining the feminine and masculine categories. In the elementary teaching sample, 47.9% were feminine while in the secondary teaching sample, 26.9% were feminine. Only 4.6% of the elementary teaching sample described themselves as masculine versus 14.9% of the secondary teaching sample. Differences were also found in the undifferentiated category. In the elementary teaching sample, 4.1% were undifferentiated while in the secondary teaching sample, 13.4% were undifferentiated. Similarities, however, were found in the androgynous category. In the elementary teaching sample, 43.4% described themselves as androgynous while in the secondary teaching sample, 44.8% described themselves as androgynous.
Table 3  Frequencies (in percent) for BEM for Elementary Teaching and Secondary Teaching Samples

<table>
<thead>
<tr>
<th>BEM (in %)</th>
<th>Elementary</th>
<th>Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feminine</td>
<td>47.9</td>
<td>26.9</td>
</tr>
<tr>
<td>Masculine</td>
<td>4.6</td>
<td>14.9</td>
</tr>
<tr>
<td>Androgynous</td>
<td>43.4</td>
<td>44.8</td>
</tr>
<tr>
<td>Undifferentiated</td>
<td>4.1</td>
<td>13.4</td>
</tr>
</tbody>
</table>

CAP is a measure of career orientation or the subject's choice in following one of six different career/employment patterns following school completion. Table 4 is a frequency table showing percentages of each level of the Career Orientation variable by elementary and secondary teaching samples. The largest percentage indicated by both samples (elementary teaching=44.3%; secondary teaching=37.3%) was at level 4 (full-time paid employment after school completion followed by a period of non-employment and then a return to full-time paid employment). At levels 5 and 6 (which indicate increasing interest in working full-time continuously), the secondary
teaching sample had higher percentages 26.9% at each level (5 and 6) than the elementary teaching sample (Level 5=19.6% and Level 6=21.5%). At Level 1 (no paid employment after school completion) neither the elementary nor the secondary teaching samples indicated this type of career pattern. Low percentages (1.4%) of the elementary teaching sample and (0.0%) of the secondary teaching sample were also found at Level 2 (full or part-time employment after school completion for a few years then no further employment). However at Level 3 (Full-time paid employment after school completion followed by a period of non-employment and then a return to part-time paid employment), a larger percentage of the elementary teaching sample (13.2%) than the secondary teaching sample (9.0%) chose this particular career pattern. While there appears to be some differences in the two samples with larger percentages of the secondary teaching sample indicating a stronger career commitment (53.8% of the secondary teaching sample indicated Level 5 or 6 compared to 41.1% of the elementary teaching sample), the majority of both samples indicated a moderate-strong career commitment (85.4% of the elementary teaching sample and 91.1% of secondary teaching sample chose Level 4, 5 or 6).

The third frequency table (Table 5) indicates percentages of the elementary and secondary samples at each of the
Table 4. Frequencies (in percent) for CAP for Elementary and Secondary Teaching Samples

<table>
<thead>
<tr>
<th>CAP (in %)</th>
<th>Elementary</th>
<th>Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No paid employment after school completion.</td>
<td>0.0</td>
<td>0.0</td>
</tr>
<tr>
<td>2. Full or part-time employment after school completion for a few years then no further employment.</td>
<td>1.4</td>
<td>0.0</td>
</tr>
<tr>
<td>3. Full-time paid employment after school completion followed by a period of non-employment and then a return to part-time paid employment.</td>
<td>13.2</td>
<td>9.0</td>
</tr>
<tr>
<td>4. Full-time paid employment after school completion followed by a period of non-employment and then a return to full-time employment.</td>
<td>44.3</td>
<td>37.3</td>
</tr>
<tr>
<td>5. Full-time paid employment after school completion followed by a period of part-time employment and then a return to full-time paid employment.</td>
<td>19.6</td>
<td>26.9</td>
</tr>
<tr>
<td>6. Continuous full-time paid employment from school completion to retirement.</td>
<td>21.5</td>
<td>26.9</td>
</tr>
</tbody>
</table>
five levels of the FCI variable. Differences in percentages were found at each level of Family-Career Importance for the elementary teaching and secondary teaching samples. When Level 1 and 2 were combined (career pursuits are more important than family pursuits), 2.3% of the elementary teaching sample and 7.5% of the secondary teaching sample fell within these combined levels. At Level 3, (career and family pursuits are equally important), 17.8% of the elementary teaching sample and 28.4% of the secondary teaching sample chose this level. The largest percentages for both samples (71.2% of the elementary teaching sample and 64.2% of the secondary teaching sample) were found at Level 4 (family pursuits are more important than career pursuits but career is important too). At Level 5 (family pursuits are far more important than career pursuits) 8.7% of the elementary teaching sample and 0.0% of the secondary teaching sample selected this level.
Table 5. Frequencies (in percent) for FCI for Elementary and Secondary Teaching Samples

<table>
<thead>
<tr>
<th>FCI (in %)</th>
<th>Elementary</th>
<th>Secondary</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Career pursuits are far more important than family pursuits.</td>
<td>0.0</td>
<td>1.5</td>
</tr>
<tr>
<td>2. Career pursuits are more important than family pursuits but family is important too.</td>
<td>2.3</td>
<td>6.0</td>
</tr>
<tr>
<td>3. Career and family pursuits are equally important.</td>
<td>17.8</td>
<td>28.4</td>
</tr>
<tr>
<td>4. Family pursuits are more important than career pursuits but career is important too.</td>
<td>71.2</td>
<td>64.2</td>
</tr>
<tr>
<td>5. Family pursuits are far more important than career pursuits.</td>
<td>8.7</td>
<td>0.0</td>
</tr>
</tbody>
</table>
Logistic Regression

The major objective of this study was to predict women's career choice of elementary and secondary teaching. Six predictor variables were chosen for the study based on their importance in the literature on the career development of women. These variables, as mentioned previously include: Sex-role orientation (BEM), self-esteem (SAS), academic achievement (GPA), mathematics ability (ACTMATH), career orientation (CAP) and family-career orientation (FCI). The dependent variable in the study was career choice (elementary and secondary teaching). A stepwise logistic regression (BMDP Statistical Software, Inc., 1990) was performed to analyze the data. As a preliminary step to assist in the selection of variables for the logistic regression model, a univariate analysis for each of the six variables chosen for the study was completed.

Treatment of Variables. For each of the three categorical variables (BEM, FCI, CAP), logistic regression (BMDP Statistical Software, Inc., 1990) generates design variables. The actual values of the variables are replaced with those of the design variable in the model. The partial method (for generating design variables) was
selected which results in a zero (0) being assigned to every design variable for cases in the first category. Cases in the first category or level of each design variable became the reference group. For variables with more than two categories, design variables were used to contrast a specified category with the first category.

Due to low frequency counts in certain categories of both FCI and CAP, categories were collapsed. Career pursuits are far more important than family pursuits (Level 1 of FCI) and Career pursuits are more important than family pursuits but family is important too (Level 2 of FCI) were collapsed into one category. Career and family pursuits are equally important (Level 3 of FCI) was not collapsed. Family pursuits are more important than career pursuits but career is important too (Level 4 of FCI) and Family pursuits are far more important than career pursuits (Level 5 of FCI) were collapsed to form one category. After collapsing, the new levels for the FCI variable are described as:

Level 1  Career pursuits are more important than family pursuits.
Level 2  Career and family pursuits are equally important.
Level 3  Family pursuits are more important than
career pursuits.

In this study there were no subjects at Level 1 of the CAP variable (No paid employment after school completion). Level 2 (Full or part-time employment after school completion for a few years then no further employment) and Level 3 (Full-time paid employment after school completion followed by a period of non-employment and then a return to part-time paid employment) were collapsed into one category. Levels 4, 5 and 6 were not collapsed. The new levels (after collapsing) for the variable CAP are described as:

Level 1 Full or part-time employment after school completion followed by a period of non-employment and then either a return to part-time employment or no further employment.

Level 2 Full-time paid employment after school completion followed by a period of non-employment and then a return to full-time paid employment.

Level 3 Full-time paid employment after school completion followed by a period of part-time employment and then a return to full-time paid employment.

Level 4 Continuous full-time paid employment from
Selection of Variables. To assist in the selection of variables for the logistic regression model, a univariate logistic regression analysis for each of the six variables chosen for the study was completed. The results of the univariate logistic regression models are presented in Table 6 and include the following information: 1) the estimated slope coefficient(s) \( \hat{\beta} \) for each of the variables, 2) the estimated standard error of the estimated slope coefficients, 3) the estimated odds ratio \( \hat{\psi} \) which is calculated by exponentiating the estimated coefficient, 4) the 95% confidence intervals (CI) for the odds ratio, 5) the value of the log-likelihood for the model, and 6) the likelihood ratio test statistic, G, for the hypothesis that the slope coefficient is zero. For each univariate logistic regression model, the G statistic is calculated by subtracting twice the difference between the log-likelihoods of the model containing only the constant (first row of the table) and each of the separate variables models. When the null hypothesis is applied, this statistic follows the chi-square distribution with 1 degree of freedom. All three continuous variables (GPA, SAS and ACTMATH) adhere to this criteria, however, the categorical variables (BEM, FCI, CAP) differ. BEM has 3 degrees of freedom, CAP has 3 degrees of freedom and FCI
Table 6. Univariate Logistic Regression Models

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\hat{\beta}$</th>
<th>SE</th>
<th>$95%$ CI</th>
<th>Log-likelihood</th>
<th>G</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>1.184</td>
<td>0.140</td>
<td></td>
<td>-155.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACTMATH</td>
<td>-0.1760E-01</td>
<td>0.254E-01</td>
<td>0.98 (0.94,1.03)</td>
<td>-155.45</td>
<td>0.49</td>
<td>0.49</td>
</tr>
<tr>
<td>GPA</td>
<td>-0.372</td>
<td>0.272</td>
<td>0.69 (0.40,1.18)</td>
<td>-154.74</td>
<td>1.90</td>
<td>0.17</td>
</tr>
<tr>
<td>SAS</td>
<td>-0.6062E-01</td>
<td>0.442E-01</td>
<td>0.94 (0.86,1.03)</td>
<td>-154.73</td>
<td>1.93</td>
<td>0.17</td>
</tr>
<tr>
<td>BEM (1)</td>
<td>-1.764</td>
<td>0.515</td>
<td>0.17 (0.622E-01,0.472)</td>
<td>-146.43</td>
<td>18.52</td>
<td>0.00</td>
</tr>
<tr>
<td>BEM (2)</td>
<td>-0.611</td>
<td>0.330</td>
<td>0.54 (0.28,1.04)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BEM (3)</td>
<td>-1.764</td>
<td>0.536</td>
<td>0.17 (0.597E-01,0.492)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FCI (1)</td>
<td>0.719</td>
<td>0.692</td>
<td>2.05 (0.53,8.01)</td>
<td>-151.87</td>
<td>7.66</td>
<td>0.02</td>
</tr>
<tr>
<td>FCI (2)</td>
<td>1.404</td>
<td>0.655</td>
<td>4.07 (1.12,14.80)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAP (1)</td>
<td>-0.318</td>
<td>0.498</td>
<td>0.73 (0.27,1.94)</td>
<td>-153.80</td>
<td>3.78</td>
<td>0.29</td>
</tr>
<tr>
<td>CAP (2)</td>
<td>-0.803</td>
<td>0.526</td>
<td>0.45 (0.16,1.26)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAP (3)</td>
<td>-0.714</td>
<td>0.524</td>
<td>0.49 (0.17,1.37)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
has 2 degrees of freedom.

Results of the univariate logistic regression model testing indicate that two variables (BEM and FCI) are highly significant with p-values of 0.000 and 0.02 respectively. ACTMATH (p-value=0.49) and CAP (p-value=0.29) are not significant and therefore, do not indicate an association with the outcome, career choice (elementary teaching versus secondary teaching). Both GPA and SAS have p-values of 0.17 indicating moderate significance. If a less stringent significance level (p-value=0.25) is used as a screening criteria then both GPA and SAS would be included in the model along with BEM and FCI. Bendel and Afifi (1977) and Mickey and Greenland (1989) found that adhering to a more conservative level (such as 0.05) can prevent the identification of variables known to be important. Therefore, to ensure the inclusion of all important variables a p-value of 0.25 was used to screen for potential variables. Based on this criteria, a model consisting of BEM, SAS, FCI and GPA was tested.

Model building and assessing the fit of the model. Information displayed in Table 7 indicates that all of the variables except for SAS show moderate-high importance in the multivariate model. As a result, a new model is fit that does not contain SAS (see Table 8). The
log-likelihood tests comparing the difference between the models in Tables 7 and 8 (a test for the significance of SAS) yield a value of \( G = -2 \left[ (-143.09) - (-142.79) \right] = 0.60. \) When this value is compared to a chi-square distribution with 1 degree of freedom a p-value > 0.30 results, indicating that SAS does not add significantly to the model controlling for the other variables in the model. Further evidence adding to the fact that SAS adds little to the model is that the estimated coefficients for the other variables are not greatly effected by the inclusion (in Table 7) or exclusion (in Table 8) of SAS. At this point the model containing the variables BEM, SAS and FCI appears to provide the best fit of the data.

The next stage in the model-building involves assessing the contribution (significance) of each interaction to the previously developed multivariate model (Table 8). The interaction of each of the three variables in the current model will be examined with one another. In Table 9, the log-likelihood, the likelihood ratio test statistic, \( G \), for the current model versus the main effects only model, the degrees of freedom for this test and its p-value are presented. In examining these three interaction terms, only BEM X FCI indicates moderate significance (p-value 0.10).
Table 7. Model Containing Variables Identified in the Univariate Analysis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Est. Coefficient</th>
<th>Est. Standard Error</th>
<th>Coefficient/Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEM (1)</td>
<td>-1.604</td>
<td>0.568</td>
<td>-2.82</td>
</tr>
<tr>
<td>BEM (2)</td>
<td>-0.489</td>
<td>0.368</td>
<td>-1.33</td>
</tr>
<tr>
<td>BEM (3)</td>
<td>-1.541</td>
<td>0.566</td>
<td>-2.72</td>
</tr>
<tr>
<td>SAS</td>
<td>-0.040</td>
<td>0.052</td>
<td>-0.77</td>
</tr>
<tr>
<td>GPA</td>
<td>-0.553</td>
<td>0.300</td>
<td>-1.85</td>
</tr>
<tr>
<td>FCI (1)</td>
<td>0.220</td>
<td>0.751</td>
<td>0.29</td>
</tr>
<tr>
<td>FCI (2)</td>
<td>0.858</td>
<td>0.717</td>
<td>1.20</td>
</tr>
<tr>
<td>Constant</td>
<td>3.299</td>
<td>1.480</td>
<td>2.23</td>
</tr>
</tbody>
</table>

Log-Likelihood = -142.79
Table 8. Multivariate Model Containing Variables Identified in Table 7

<table>
<thead>
<tr>
<th>Variables</th>
<th>Est. Coefficient</th>
<th>Est. Standard Error</th>
<th>Coefficient/Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEM (1)</td>
<td>-1.753</td>
<td>0.537</td>
<td>-3.37</td>
</tr>
<tr>
<td>BEM (2)</td>
<td>-0.604</td>
<td>0.337</td>
<td>-1.79</td>
</tr>
<tr>
<td>BEM (3)</td>
<td>-1.573</td>
<td>0.563</td>
<td>-2.79</td>
</tr>
<tr>
<td>GPA</td>
<td>-0.519</td>
<td>0.296</td>
<td>-1.75</td>
</tr>
<tr>
<td>FCI (1)</td>
<td>0.193</td>
<td>0.750</td>
<td>0.26</td>
</tr>
<tr>
<td>FCI (2)</td>
<td>0.814</td>
<td>0.715</td>
<td>1.14</td>
</tr>
<tr>
<td>Constant</td>
<td>2.531</td>
<td>1.090</td>
<td>2.32</td>
</tr>
</tbody>
</table>

Log-Likelihood = -143.09
Table 9 Possible Interactions of Interest to be Added to the Main Effects Only Model

<table>
<thead>
<tr>
<th>Interaction</th>
<th>Log-Likelihood</th>
<th>G</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main Effects Only</td>
<td>-143.09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BEM X GPA</td>
<td>-142.98</td>
<td>0.22</td>
<td>3</td>
<td>0.98</td>
</tr>
<tr>
<td>BEM X FCI</td>
<td>-137.51</td>
<td>11.16</td>
<td>6</td>
<td>0.10</td>
</tr>
<tr>
<td>GPA X FCI</td>
<td>-142.98</td>
<td>0.22</td>
<td>2</td>
<td>0.90</td>
</tr>
</tbody>
</table>

These results suggest that there are two possible models to explain the data: 1) a model consisting of BEM, FCI and GPA and 2) a model consisting of BEM, FCI, GPA and BEM X FCI. Figure 1 shows a plot of the predicted log odds for the BEM variable by the FCI variable. The feminine, androgynous and undifferentiated levels of BEM represent similar relationships to FCI (at each of the three levels). As the figure illustrates, there is a slight increase in the odds of choosing elementary education moving from the "career is more important than family" group to the "career and family are equal" group. However, moving from the "career and family are equal" group to the "family is more important than career" group shows a significant increase in the odds of choosing
Figure 1. Predicted Log Odds for Choice of Elementary Teaching by FCI for Each Level of BEM
elementary education. This pattern is different for the masculine level of BEM. There is a gradual linear increase in the odds of choosing elementary education moving from the "career is more important than family" group to the "career and family are equal" group to the "family is more important than career" group. The difference in pattern indicates an interaction effect at the masculine level of BEM and the "family is more important than career" level of FCI and indicates that the family-career importance variable does not have as important an impact on the odds of choosing elementary education for the masculine level of BEM as it does for the other three levels of BEM.

Similar to the univariate analyses, results of the stepwise logistic regression indicate that BEM is the most important variable (p-value=.0001) followed by GPA (p-value=0.101) and FCI (p-value=0.136) (See Table 10). SAS, CAP and ACTMATH were not significant variables (relative to the criteria of p-value to enter=.15 and p-value to remove=20) and as a result, were not entered into the stepwise procedure.
Table 10  Stepwise Logistic Regression Model

<table>
<thead>
<tr>
<th>Term</th>
<th>Log-Likelihood</th>
<th>Likelihood</th>
<th>df</th>
<th>p-ratio</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-155.69</td>
<td></td>
<td>3</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>Step 1</td>
<td>BEM</td>
<td>-146.43</td>
<td>3</td>
<td>18.521</td>
<td>0.101</td>
</tr>
<tr>
<td>Step 2</td>
<td>GPA</td>
<td>-145.09</td>
<td>1</td>
<td>2.682</td>
<td>0.136</td>
</tr>
<tr>
<td>Step 3</td>
<td>FCI</td>
<td>-143.09</td>
<td>2</td>
<td>3.995</td>
<td></td>
</tr>
</tbody>
</table>

The results of both model-building strategies used to analyze the data for this study indicate that a model containing BEM, FCI and GPA is adequate in describing the outcome variable. A second model was generated from analyzing interaction terms. This model consists of BEM, GPA, FCI and FCI X BEM. Further assessment of both models were completed by evaluating the "Hosmer" goodness-of-fit chi square test. For model 1 (BEM, FCI and GPA) the Hosmer goodness-of-fit test produced the p-value=0.653 and for model 2 (BEM, FCI, GPA and BEM X FCI) the Hosmer goodness-of-fit test produced the p-value of 0.148. These results indicate that Model 1 is a more adequate model in predicting the career choice of elementary teaching.
Interpretation of the coefficients. The last step in the analysis of data is the interpretation of the coefficients of the logistic regression model. The data was interpreted in terms of determining the relationship between elementary or secondary teaching (dependent variable) and BEM, FCI and GPA (independent variables). The stepwise logistic regression model containing BEM, FCI and GPA was used to interpret the results of the study.

At Step 1 in the Logistic regression stepping procedure BEM is entered into the model. BEM is the most important variable of the six variables included in the study and is highly significant (p-value=0.0001). Table 11 shows the results of the logistic regression model when BEM is entered. The data indicates that subjects who describe themselves as masculine are approximately six times (odds ratio=0.17) more likely to choose secondary teaching over elementary teaching when compared to subjects who describe themselves as feminine. These same results were obtained from subjects who described themselves as undifferentiated. The undifferentiated group (relative to the feminine group) is approximately six times (odds ratio=0.17) more likely to choose secondary teaching than elementary teaching. The data also suggests that those subjects describing themselves as androgynous are over one
and one half times (odds ratio=0.54) more likely to choose secondary teaching than elementary teaching when compared to subjects describing themselves as feminine.

In terms of choice of elementary teaching, results indicate that the odds of choosing elementary teaching are 5.88 to 1 for subjects who described themselves as feminine. Furthermore, there is an increase in the likelihood of choosing elementary teaching when one moves from either the masculine or undifferentiated group to the feminine group. The multiplicative change in the odds of choosing elementary teaching going from either the masculine group or the undifferentiated group to the feminine group is 5.88 (odds ratio=1/0.171). Although the odds are not as high, the odds ratio (1/0.543=1.9) indicates that the choice of elementary teaching is 1.9 times as likely when going from the androgynous group to the feminine group.

Based on a p-value of 0.106, GPA is entered in the model at Step 2 as the second most important variable. While GPA is not a significant indicator of choice (p-value=0.101), results indicate that it's presence alters the estimated odds ratios for BEM. Table 12 shows that as GPA increases (per letter grade) subjects were almost two-thirds (odds ratio=0.627) more likely to choose secondary
Table 11. Results of Logistic Regression Model at Step 1. BEM is entered into the Model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Est. Coefficient</th>
<th>Standard Error</th>
<th>Coefficient/Standard Error</th>
<th>$\hat{\psi}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEM (1)</td>
<td>-1.764</td>
<td>0.515</td>
<td>-3.43</td>
<td>0.17</td>
</tr>
<tr>
<td>BEM (2)</td>
<td>-0.611</td>
<td>0.330</td>
<td>-1.85</td>
<td>0.54</td>
</tr>
<tr>
<td>BEM (3)</td>
<td>-1.764</td>
<td>0.536</td>
<td>-3.29</td>
<td>0.17</td>
</tr>
<tr>
<td>Constant</td>
<td>1.764</td>
<td>0.255</td>
<td>6.91</td>
<td>5.83</td>
</tr>
</tbody>
</table>
teaching than elementary teaching when BEM is held constant.

Controlling for GPA, the estimated odds ratios for BEM are somewhat different than if BEM were the only variable in the model (Step 1). Compared to the feminine group, the masculine group is approximately 6.5 times (odds ratio=0.15) more likely to choose secondary teaching over elementary teaching. The undifferentiated group is 5.6 times (odds ratio=0.18) more likely to choose secondary teaching than elementary teaching relative to the feminine group. The estimated odds ratio for the androgynous group was not significantly altered by GPA. When compared to the feminine group, the androgynous group is one and one half (odds ratio=0.52) as likely to choose secondary teaching over elementary teaching.

Table 13 reports the results of the logistic regression model at Step 3 when FCI is entered into the model. FCI is the next most important variable (p-value=0.127). The model now contains all three variables (BEM, GPA, and FCI). Similar to GPA at Step 2, FCI is not a significant indicator of choice in this model (p-value=0.14), however, it does add to the model by influencing the estimated odds ratio of GPA and BEM. In this final model, the data indicates that as GPA increases (per letter grade)
Table 12. Results of Logistic Regression Model at Step 2. GPA is entered into the Model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Est. Coefficient</th>
<th>Standard Error</th>
<th>Coefficient/Standard Error</th>
<th>$\hat{\psi}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPA</td>
<td>-0.466</td>
<td>0.288</td>
<td>-1.62</td>
<td>0.63</td>
</tr>
<tr>
<td>BEM (1)</td>
<td>-1.883</td>
<td>0.526</td>
<td>-3.58</td>
<td>0.15</td>
</tr>
<tr>
<td>BEM (2)</td>
<td>-0.661</td>
<td>0.333</td>
<td>-1.98</td>
<td>0.52</td>
</tr>
<tr>
<td>BEM (3)</td>
<td>-1.734</td>
<td>0.538</td>
<td>-3.22</td>
<td>0.18</td>
</tr>
<tr>
<td>Constant</td>
<td>3.072</td>
<td>0.860</td>
<td>3.57</td>
<td>21.60</td>
</tr>
</tbody>
</table>
subjects are 60% (odds ratio=0.60) more likely to choose secondary teaching than elementary teaching when BEM and FCI are held constant. Estimated odds ratios for BEM indicate that controlling for GPA and FCI, those subjects in the masculine group are 5.8 times (odds ratio=0.17) more likely to choose secondary teaching over elementary teaching relative to subjects in the feminine group. Similarly, the undifferentiated group is 4.8 (odds ratio=0.21) times more likely to choose secondary teaching over elementary teaching compared to the feminine group. The androgynous group (consistent with results at Step 1 and 2) is one and one half as likely to choose secondary teaching over elementary teaching when compared with the feminine group. With regard to the FCI variable, the data suggests subjects indicating that family pursuits are more important than career pursuits are more than twice (odds ratio=2.26) as likely to choose elementary teaching than secondary teaching relative to subjects indicating that career pursuits are more important than family pursuits. These latter results are produced when both GPA and BEM are held constant.

Examination of the coefficients of the logistic regression model indicates that BEM is a highly significant predictor of career choice, while GPA and FCI are moderately influential. Interpretation of the odds ratios for all
Table 13. Results of Logistic Regression Model at Step 3. FCI is entered into the Model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Est. Coefficient</th>
<th>Standard Error</th>
<th>Coefficient/Standard Error</th>
<th>( \widehat{\theta} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPA</td>
<td>-0.519</td>
<td>0.296</td>
<td>-1.75</td>
<td>0.60</td>
</tr>
<tr>
<td>BEM (1)</td>
<td>-1.753</td>
<td>0.537</td>
<td>-3.27</td>
<td>0.17</td>
</tr>
<tr>
<td>BEM (2)</td>
<td>-0.604</td>
<td>0.337</td>
<td>-1.79</td>
<td>0.55</td>
</tr>
<tr>
<td>BEM (3)</td>
<td>-1.573</td>
<td>0.563</td>
<td>-2.79</td>
<td>0.21</td>
</tr>
<tr>
<td>FCI (1)</td>
<td>0.194</td>
<td>0.750</td>
<td>0.26</td>
<td>1.21</td>
</tr>
<tr>
<td>FCI (2)</td>
<td>0.814</td>
<td>0.715</td>
<td>1.14</td>
<td>2.26</td>
</tr>
<tr>
<td>Constant</td>
<td>2.531</td>
<td>1.09</td>
<td>2.32</td>
<td>12.60</td>
</tr>
</tbody>
</table>
elementary education. This pattern is different for the masculine level of BEM. There is a gradual linear increase in the odds of choosing elementary education moving from the "career is more important than family" group to the "career and family are equal" group to the "family is more important than career" group. The difference in pattern indicates an interaction effect at the masculine level of BEM and the "family is more important than career" level of FCI and indicates that the family-career importance variable does not have as important an impact on the odds of choosing elementary education for the masculine level of BEM as it does for the other three levels of BEM.

Similar to the univariate analyses, results of the stepwise logistic regression indicate that BEM is the most important variable (p-value=.0001) followed by GPA (p-value=0.101) and FCI (p-value=0.136) (See Table 10). SAS, CAP and ACTMATH were not significant variables (relative to the criteria of p-value to enter=.15 and p-value to remove=20) and as a result, were not entered into the stepwise procedure.
Table 10  Stepwise Logistic Regression Model

<table>
<thead>
<tr>
<th>Term</th>
<th>Log-Likelihood</th>
<th>Likelihood Ratio</th>
<th>df</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-155.69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Step 1 BEM</td>
<td>-146.43</td>
<td>18.521</td>
<td>3</td>
<td>0.000</td>
</tr>
<tr>
<td>Step 2 GPA</td>
<td>-145.09</td>
<td>2.682</td>
<td>1</td>
<td>0.101</td>
</tr>
<tr>
<td>Step 3 FCI</td>
<td>-143.09</td>
<td>3.995</td>
<td>2</td>
<td>0.136</td>
</tr>
</tbody>
</table>

The results of both model-building strategies used to analyze the data for this study indicate that a model containing BEM, FCI and GPA is adequate in describing the outcome variable. A second model was generated from analyzing interaction terms. This model consists of BEM, GPA, FCI and FCI X BEM. Further assessment of both models were completed by evaluating the "Hosmer" goodness-of-fit chi square test. For model 1 (BEM, FCI and GPA) the Hosmer goodness-of-fit test produced the p-value=0.653 and for model 2 (BEM, FCI, GPA and BEM X FCI) the Hosmer goodness-of-fit test produced the p-value of 0.148. These results indicate that Model 1 is a more adequate model in predicting the career choice of elementary teaching.
Interpretation of the coefficients. The last step in the analysis of data is the interpretation of the coefficients of the logistic regression model. The data was interpreted in terms of determining the relationship between elementary or secondary teaching (dependent variable) and BEM, FCI and GPA (independent variables). The stepwise logistic regression model containing BEM, FCI and GPA was used to interpret the results of the study.

At Step 1 in the Logistic regression stepping procedure BEM is entered into the model. BEM is the most important variable of the six variables included in the study and is highly significant (p-value=0.0001). Table 11 shows the results of the logistic regression model when BEM is entered. The data indicates that subjects who describe themselves as masculine are approximately six times (odds ratio=0.17) more likely to choose secondary teaching over elementary teaching when compared to subjects who describe themselves as feminine. These same results were obtained from subjects who described themselves as undifferentiated. The undifferentiated group (relative to the feminine group) is approximately six times (odds ratio=0.17) more likely to choose secondary teaching than elementary teaching. The data also suggests that those subjects describing themselves as androgynous are over one
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In terms of choice of elementary teaching, results indicate that the odds of choosing elementary teaching are 5.88 to 1 for subjects who described themselves as feminine. Furthermore, there is an increase in the likelihood of choosing elementary teaching when one moves from either the masculine or undifferentiated group to the feminine group. The multiplicative change in the odds of choosing elementary teaching going from either the masculine group or the undifferentiated group to the feminine group is 5.88 (odds ratio=1/0.171). Although the odds are not as high, the odds ratio (1/0.543=1.9) indicates that the choice of elementary teaching is 1.9 times as likely when going from the androgynous group to the feminine group.

Based on a p-value of 0.106, GPA is entered in the model at Step 2 as the second most important variable. While GPA is not a significant indicator of choice (p-value=0.101), results indicate that it's presence alters the estimated odds ratios for BEM. Table 12 shows that as GPA increases (per letter grade) subjects were almost two-thirds (odds ratio=0.627) more likely to choose secondary
Table 11. Results of Logistic Regression Model at Step 1. BEM is entered into the Model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Est. Coefficient</th>
<th>Standard Error</th>
<th>Coefficient/Standard Error</th>
<th>( \hat{\psi} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEM (1)</td>
<td>-1.764</td>
<td>0.515</td>
<td>-3.43</td>
<td>0.17</td>
</tr>
<tr>
<td>BEM (2)</td>
<td>-0.611</td>
<td>0.330</td>
<td>-1.85</td>
<td>0.54</td>
</tr>
<tr>
<td>BEM (3)</td>
<td>-1.764</td>
<td>0.536</td>
<td>-3.29</td>
<td>0.17</td>
</tr>
<tr>
<td>Constant</td>
<td>1.764</td>
<td>0.255</td>
<td>6.91</td>
<td>5.83</td>
</tr>
</tbody>
</table>
teaching than elementary teaching when BEM is held constant.

Controlling for GPA, the estimated odds ratios for BEM are somewhat different than if BEM were the only variable in the model (Step 1). Compared to the feminine group, the masculine group is approximately 6.5 times (odds ratio=0.15) more likely to choose secondary teaching over elementary teaching. The undifferentiated group is 5.6 times (odds ratio=0.18) more likely to choose secondary teaching than elementary teaching relative to the feminine group. The estimated odds ratio for the androgynous group was not significantly altered by GPA. When compared to the feminine group, the androgynous group is one and one half (odds ratio=0.52) as likely to choose secondary teaching over elementary teaching.

Table 13 reports the results of the logistic regression model at Step 3 when FCI is entered into the model. FCI is the next most important variable (p-value=0.127). The model now contains all three variables (BEM, GPA, and FCI). Similar to GPA at Step 2, FCI is not a significant indicator of choice in this model (p-value=0.14), however, it does add to the model by influencing the estimated odds ratio of GPA and BEM. In this final model, the data indicates that as GPA increases (per letter grade)
Table 12. Results of Logistic Regression Model at Step 2. GPA is entered into the Model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Est. Coefficient</th>
<th>Standard Error</th>
<th>Coefficient/Standard Error</th>
<th>( \hat{\psi} )</th>
</tr>
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<tbody>
<tr>
<td>GPA</td>
<td>-0.466</td>
<td>0.288</td>
<td>-1.62</td>
<td>0.63</td>
</tr>
<tr>
<td>BEM (1)</td>
<td>-1.883</td>
<td>0.526</td>
<td>-3.58</td>
<td>0.15</td>
</tr>
<tr>
<td>BEM (2)</td>
<td>-0.661</td>
<td>0.333</td>
<td>-1.98</td>
<td>0.52</td>
</tr>
<tr>
<td>BEM (3)</td>
<td>-1.734</td>
<td>0.538</td>
<td>-3.22</td>
<td>0.18</td>
</tr>
<tr>
<td>Constant</td>
<td>3.072</td>
<td>0.860</td>
<td>3.57</td>
<td>21.60</td>
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</table>
subjects are 60% (odds ratio=0.60) more likely to choose secondary teaching than elementary teaching when BEM and FCI are held constant. Estimated odds ratios for BEM indicate that controlling for GPA and FCI, those subjects in the masculine group are 5.8 times (odds ratio=0.17) more likely to choose secondary teaching over elementary teaching relative to subjects in the feminine group. Similarly, the undifferentiated group is 4.8 (odds ratio=0.21) times more likely to choose secondary teaching over elementary teaching compared to the feminine group. The androgynous group (consistent with results at Step 1 and 2) is one and one half as likely to choose secondary teaching over elementary teaching when compared with the feminine group. With regard to the FCI variable, the data suggests subjects indicating that family pursuits are more important than career pursuits are more than twice (odds ratio=2.26) as likely to choose elementary teaching than secondary teaching relative to subjects indicating that career pursuits are more important than family pursuits. These latter results are produced when both GPA and BEM are held constant.

Examination of the coefficients of the logistic regression model indicates that BEM is a highly significant predictor of career choice, while GPA and FCI are moderately influential. Interpretation of the odds ratios for all
Table 13. Results of Logistic Regression Model at Step 3. FCI is entered into the Model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Est. Coefficient</th>
<th>Standard Error</th>
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</tr>
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<tbody>
<tr>
<td>GPA</td>
<td>-0.519</td>
<td>0.296</td>
<td>-1.75</td>
<td>0.60</td>
</tr>
<tr>
<td>BEM (1)</td>
<td>-1.753</td>
<td>0.537</td>
<td>-3.27</td>
<td>0.17</td>
</tr>
<tr>
<td>BEM (2)</td>
<td>-0.604</td>
<td>0.337</td>
<td>-1.79</td>
<td>0.55</td>
</tr>
<tr>
<td>BEM (3)</td>
<td>-1.573</td>
<td>0.563</td>
<td>-2.79</td>
<td>0.21</td>
</tr>
<tr>
<td>FCI (1)</td>
<td>0.194</td>
<td>0.750</td>
<td>0.26</td>
<td>1.21</td>
</tr>
<tr>
<td>FCI (2)</td>
<td>0.814</td>
<td>0.715</td>
<td>1.14</td>
<td>2.26</td>
</tr>
<tr>
<td>Constant</td>
<td>2.531</td>
<td>1.09</td>
<td>2.32</td>
<td>12.60</td>
</tr>
</tbody>
</table>
three steps of the stepwise logistic regression procedure show consistent findings. Using the feminine group as a reference group, subjects in both the masculine and undifferentiated groups of BEM are more likely (approximately 5 times) to choose secondary teaching than elementary teaching. Although not as strong, there was a similar trend among those subjects falling into the androgynous group. The androgynous group was one and one half as likely to choose secondary teaching than elementary teaching relative to the feminine group. The data in the study suggested that as GPA increased (per letter grade) subjects were more inclined to choose secondary teaching than elementary teaching. The importance of family (over career importance) was somewhat important in predicting choice (of elementary teaching).
Chapter V

Discussion

Summary

Early theories of vocational behavior were developed as a result of research conducted on men. As the number of women entering the labor force grew, theories of career development based on men were equally applied to women. During the last twenty years there has been considerable research examining the vocational behavior of women. The results of this research suggest that the career development of women is different than the career development of men. Issues such as marriage and childbearing as well as the process of socialization impact women and their decisions about work in ways that do not affect men. Although the number of women entering the work force is on the rise, the nature of women's participation in the labor force continues to be different than that of men. At all levels of employment, women (on the average) earn lower wages and obtain positions that are lower in status than men. Frequently women are found
in positions in which their talents and abilities are underutilized. While there have been changes in the number of women entering certain fields (once considered male-dominated) that offer higher salaries and more prestigious jobs (i.e., accounting, pharmacology, computer science, banking and financial management), the majority of women are found in traditional occupations.

Research on the career development of women began with comparing groups of women, i.e., career-oriented women and homemaking-oriented women (Hoyt & Kennedy, 1958) and progressed to categorizing women according to the nature and degree of career orientation, i.e., traditional orientation versus non-traditional orientation (Astin & Myint, 1971; Nagely, 1971; Standley & Soule, 1974; Tangri, 1972). Based on vocational participation, career patterns were devised and utilized by researchers (Betz, 1984; Super, 1957; Wolfson, 1976; Zytowski, 1969) to describe women's career behavior. Numerous studies have been conducted in the area of women's career development in which individual variables have been used to predict women's occupational choice (i.e., Antill & Cunningham, 1979, Card, Steel & Abeles, 1980; Chipman & Thomas, 1985; Gigy, 1980; Lemkau, 1979). Recently, several multivariate attempts have been made to examine these variables in combination and to provide a multidimensional
understanding of the career development of women (Astin, 1984; Farmer, 1985; Betz & Fitzgerald, 1987, as tested by Fassinger, 1985, 1990). While these efforts have added significantly to the knowledge of women's career development theory, there is not yet an adequate theory to explain the career behavior of women.

The majority of past research has utilized samples of women interested in a variety of major/career fields. However, there may be advantages to utilizing a sample of women who express an interest in one occupational field. Fassinger (1990) believes that problems occurred in the career choice models in her study due to the large number of women planning science-related careers in traditionally female fields which interfered with the predictive capacity of the models. To resolve this problem she suggests grouping subjects according to science-relatedness categories of occupational choice. For example, Goldman and Hewitt (1976) devised a coding system (that Fassinger, 1987, 1990 utilized) in order to categorize occupations/major fields into one of five science-non-science categories: 1=fine arts, 2=humanities, 3=social sciences, 4=biological sciences and 5=physical sciences. However, even within these categories differences may be found. Category 4 (biological sciences) contains both dietetics and animal
While these are both science-related occupations/major fields, variables predicting the choice of these two areas of study may be very different. Therefore, further specification within categories and in particularly, within occupations may assist in providing an accurate model (or models) of career choice.

This study utilized a sample of women in one occupational category (teaching) in an attempt to provide a clear understanding of which variables predict career choice. The results of the research provide increased knowledge about the career development of women choosing one occupation and suggest that career development patterns may vary from occupation to occupation. Variables predictive of choice in teaching may not pertain to other occupations.

The purpose of this study was to add to the knowledge base of women's career development through providing a better understanding of the variables that predict career choice of education among college women. Specifically, several predictor variables were selected for the study based on research that provided evidence of their importance in the career development of women. These variables included: academic achievement (GPA), mathematics ability (ACTMATH), self-esteem (SAS), sex-role orientation (BEM), career
orientation (CAP) and family-career importance (FCI). The dichotomous dependent (outcome) variable for the study was elementary teaching and secondary teaching. Subjects included 286 female students participating in the Freshman Early Experience Program (FEEP) during the winter and spring quarter, 1990 at The Ohio State University. FEEP is a course designed for students interested in teaching and provides an exploratory experience to assist in career decision making.

Descriptive data of the sample indicated both similarities and differences in the elementary (N=219) and secondary teaching (N=67) samples. While the mean ages for the two samples (19.2, 19.3) were similar, differences were found in class status. Although the majority of subjects in both the elementary teaching and secondary teaching samples were freshmen (68.9% and 53.7% respectively), larger percentages of subjects in the secondary teaching sample were found at the sophomore and junior levels than in the elementary teaching sample. In the secondary teaching sample 35.8% were at the sophomore level and 10.4% were at the junior level. In the elementary teaching sample, 25.6% were at the sophomore level and only 5% at the junior level.
Calculated means and standard deviations for the two academic-related variables (GPA and ACTMATH) and self-esteem (SAS) indicate similarities in the two samples. Mean GPAs for both the elementary teaching and secondary teaching samples are above average (M=2.68, 2.78). Mean ACTMATH scores are above average (M=18.25, 18.79) compared to a national average (17.1) but are below average compared to incoming freshmen at The Ohio State University (20.3). Mean scores of 19.10 and 19.73 on a measure of self-esteem (SAS) indicated moderate levels of self-esteem for both samples.

Frequency tables were completed for each of the three categorical variables: sex-role orientation (BEM), career orientation (CAP) and family-career importance (FCI). Differences in sex-role orientation were found, especially in examining the feminine and masculine categories. Of the elementary teaching sample 47.9% were feminine compared to 26.9% of the secondary teaching sample. Only 4.6% of the elementary teaching sample described themselves as masculine versus 14.9% of the secondary teaching sample. Similarities were found in the androgynous category (43.4% of the elementary teaching sample and 44.8% of the secondary teaching sample).
Frequency data for the Career Orientation (CAP) variable indicated that the largest percentage of both the elementary teaching (44.3%) and secondary teaching (37.3%) samples were found at Level 4 (Full-time paid employment after school completion followed by a period of non-employment and then a return to full-time paid employment). Neither the elementary teaching nor the secondary teaching samples indicated an interest in a career pattern involving no paid employment after school completion (Level 1). Low percentages (1.4%, 0.0%) were also found at Level 2 (Full or part-time employment after school completion for a few years then no further employment) and a higher percentage of the secondary teaching sample (53.8%) than the elementary teaching sample (41.1%) were found at levels 5 and 6 indicating a stronger commitment to career.

Differences were found in the family-career importance (FCI) variable. Although the majority of both the elementary teaching (71.2%) and secondary teaching (64.2%) samples were found at Level 4 (Family pursuits are more important than career pursuits, but career is important too), the data indicates that the elementary teaching sample places more importance on family than on career pursuits compared to the secondary teaching sample. Of the elementary teaching sample 8.7% indicated that family
pursuits are far more important than career pursuits compared to 0.0% of the secondary teaching sample. Only 2.3% of the elementary teaching sample indicated that career pursuits were more important than family pursuits.

A logistic regression model was chosen to analyze the data based on its capability to handle categorical dependent variables and both categorical and continuous independent variables. While this procedure is not typically used in the social sciences, it is frequently used in other fields, particularly in the health sciences. The goal of logistic regression is to generate the best fitting and most parsimonious model to describe the association between an outcome (dependent) variable and a group of predictor (independent) variables.

Six predictor variables (GPA, ACTMATH, SAS, BEM, CAP, FCI) important in the career development of women were entered into a stepwise logistic regression (available on BMDP, 1990). At each step variables were analyzed to determine their significance and whether to include them in the model. Results of the stepwise procedure indicated that a model consisting of sex-role orientation (BEM), academic achievement (GPA) and family-career importance (FCI) best explained the data in terms of predicting career choice (elementary teaching or secondary teaching).
Sex role orientation (BEM) was the most important variable in the study and highly significant (p-value=0.0001). Further interpretation of this variable indicated that subjects in the masculine and undifferentiated groups were five to six times (odds ratio=0.17) more likely to choose secondary teaching than elementary teaching relative to the feminine group. Results also suggest that the choice of secondary teaching is approximately one and one half (odds ratio=0.54) as likely among subjects describing themselves as androgynous than those describing themselves as feminine. Academic achievement (GPA) (p-value=0.106) and family-career importance (FCI) (p-value=0.127) were less significant (in predicting choice) than sex-role orientation but nonetheless affected the model somewhat allowing them to remain in the model. GPA entered as the second most important variable. Results indicated that as GPA increases (per letter grade) subjects were almost two-thirds (odds ratio=0.627) more likely to choose secondary teaching than elementary teaching. At the last step in the stepwise logistic regression procedure, FCI enters. While only moderately significant, the data suggested that subjects placing more importance on family pursuits than career pursuits are more than twice (odds ratio=2.26) as likely to choose elementary teaching over secondary teaching relative to subjects placing more importance on career pursuits than family pursuits.
Interpretation of the Findings

The most significant predictor variable of career choice (elementary or secondary teaching) in the study was sex-role orientation. The results indicated that subjects who described themselves as feminine (defined as individuals who tend to have more expressive characteristics, such as sympathy, sensitivity to the needs of others, warmth, understanding) are more likely to choose elementary teaching than secondary teaching. In addition, the likelihood of choosing elementary teaching decreases as one moves from the feminine group to the androgynous group, to the undifferentiated group and finally to the masculine group. Therefore, subjects who described themselves as feminine are the most likely to choose elementary teaching while those subjects who described themselves as masculine are the least likely to choose elementary teaching.

These results support previous research indicating a relationship between sex-role orientation and traditional or non-traditional career choice. For example, Wolfe and Betz (1981) found more masculine typed women in engineering than in home economics and more feminine typed women in home economics than in engineering. Stringer and
Duncan (1985) found women who chose non-traditional occupations in skilled crafts, labor and technical fields tended to have non-traditional attitudes about sex roles. Similarly, one of the findings of Fassinger's (1990) multivariate model was that instrumental personality characteristics predicted a tendency towards nontraditional choice for women.

Different from previous research attempts on the career choice of women, this study examines two career options within the teaching field. Therefore, while previous research on non-traditional versus traditional career choice may have relevance for the predictive model for elementary teaching, the predictive model for secondary teaching is different and reveals new and interesting findings. Results indicate that subjects in the masculine category of BEM were approximately six times more likely to choose secondary teaching over elementary teaching when compared to those in the feminine category of BEM. These results indicate that subjects who described themselves as masculine (defined as individuals who tend to have more instrumental characteristics, such as independence, assertion and competitiveness) tended to choose secondary teaching over elementary teaching. In addition, subjects in the androgynous group (defined as individuals who tend to have both instrumental and expressive characteristics)
were 1.85 times more likely to choose secondary teaching over elementary teaching when compared to subjects in the feminine group. If this study had utilized two very different occupational choices (i.e., teaching and engineering) these nuances within the teaching field may have been overlooked. The differences in predictive models of choice of elementary and secondary teaching in this study point to the error in assuming that all teachers share similar characteristics. Generalizations about teaching that group elementary and secondary teaching together are not necessarily factual. These findings indicate the need for indepth investigation within occupational groups in order to detect important differences as well as similarities.

Although not as significant as sex-role orientation, academic achievement was a moderately significant indicator of choice in this study. The results indicated that as GPA increases (per letter grade) subjects were over one and one-half times (odds ratio=1/0.627=1.59) more likely to choose secondary teaching than elementary teaching. In this study lower GPAs were more predictive of elementary teaching than of secondary teaching. The literature on ability and women's career choice indicates a relationship between high ability/achievement and non-traditional major/occupational choice (Carney & Morgan,
1981; Fassinger, 1990; Peng & Jaffe, 1979). Lemkau (1983) found that women in sex-atypical occupations (i.e., accounting, engineering, chemistry) were brighter than those in sex-typical occupational fields (i.e., library science, nursing, elementary education). Perhaps more than any other topic in the literature on teaching, the academic ability of perspective teachers has received the most attention. With few exceptions, the research indicates that individuals who choose to become teachers have below average academic ability compared to others choosing different fields of study (i.e., Atkins, 1981; Carnegie Foundation for the Advancement of Teaching, 1986; Lyons, 1980; Vance & Schlecty, 1982; Weaver, 1979).

Bethune (1981) found that low ability was one of the strongest predictors of majoring in education. However, it is important to point out that the results of this research do not necessarily support or contradict other research linking low ability to traditional occupational choice or to choice of teaching. The findings are relative to one occupational grouping and pertain to the probability of academic ability impacting career choice of elementary teaching versus secondary teaching.

The family versus career importance was also a moderately significant predictor of choice in this study. The data indicates that subjects who place more importance on
family pursuits than on career pursuits are more likely to choose elementary teaching than secondary teaching when compared to subjects indicating that career pursuits are more important than family pursuits. Book, Byers, and Freeman (1983) found that traditional female role models had an important effect on influencing career aspirations of pre-service teachers. Although not known, the results suggest that the influence of traditional female role models may be operating with this sample of women as well.

Limitations

1) The first limitation of the study is the generalizability of the research findings. The study utilized a sample of women interested in becoming teachers from one university setting. Therefore, the findings of the research cannot be generalized beyond the university from which the sample was selected and cannot be generalized beyond the specific occupational group from which the sample was selected.

2) A second limitation pertains to data collection. The data was collected as a part of FEEP. All of the inventories were distributed to subjects during the orientation meeting of FEEP with instructions to return them the following week. Five different FEEP instructors
explained the purpose of the research to the subjects and managed the administration and collection of the inventories. Although written instructions were given to each FEEP instructor by the researcher, differences in instructors' personality and classroom style may have influenced subjects in how they approached and completed the inventories.

3) The last limitation of the study pertains to the data analysis. Results of the logistic regression data analysis indicated two possible models to explain the career choice of teaching in this sample. One model contained sex-role orientation (BEM), academic achievement (GPA) and family-career importance (FCI) and the second model contained these three variables as well as an interaction term (BEM and FCI). While further investigation found that the interaction was confined to the masculine level of BEM and the family importance level of FCI, the interpretation of the model itself is not clear. Further research is needed to determine both the importance of the interaction as well as how to separate out the interaction effect so it can be utilized in the model.
Implications and Conclusions

The present study represents an effort to add to the knowledge of the career development of women by providing a predictive model of career choice of teaching. The research findings as well as the approach and methodology utilized in the study have important theoretical and empirical implications for the career development of women.

One of the major criticisms of applying career development theory based on men to the career development of women is that it does not account for the life patterns or the socialization process that are unique to women. The results of this research effort provide evidence that supports the importance of sex role orientation in the career development of women. Sex-role orientation or how subjects described themselves in terms of expressive (feminine), instrumental (masculine) or both expressive and instrumental (androgynous) characteristics was highly predictive of the career choice of teachers in this study. The socialization process (along with biological and psychological processes) may be influential in the development of sex role orientation.
Central to understanding the importance of the socialization process in the career development of women is research on adult development. Several researchers (Chodorow, 1978; Gilligan, 1982; Josselson, 1987; Lyon, 1983) have focused on either the socialization process or the development process which includes biological, inner psychic and socialization processes in relation to identity formation. Results of these studies indicate that there are two separate and distinct identity formation processes related to gender, and these two processes influence the socialization and individualization processes for males and females in different ways. Women's identity tends to be formed through attachments, first with the mother and later with peers and lovers, all indicating that relationships and connectedness are very important in the process. For men, separation, first from the mother and later from family and peers, and autonomy are emphasized in the process. Hence, for many men, identity focuses on career and achievement, while for females identity development focuses either away from career, achievement and competition towards relationships and connections to others, or it focuses on both relationships and achievement. These different emphases in process lead to different experiences and choices for men and women, one of which is occupational choice.
Another finding in this study which lends support to the development of separate career development theories for men and women is the importance of family-career in predicting career choice. Research on adult development provides insight into the complexity of managing family, marriage and career roles for women and how this issue differs for men and women. Studies (Chodorow, 1978; Gilligan, 1982; Josselson, 1987; Lyon, 1983) indicate that most women view relationships as a web of interrelated connections while most men have a hierarchical view of relationships. These different views of relationships become important in understanding why women have difficulty in separating life roles. For most women, the roles of wife, mother and worker are linked together; for most men, these roles are separate (Tittle, 1982). As a result, decisions that women make in one area of their lives is viewed as interconnected with decisions in other areas which leads to a complex decision-making process.

The research findings in this study indicate that sex role orientation as well as decisions regarding the importance of family and career impacted the career choice process for this sample of women. It appears that how to manage family, marriage, and career within the context of societal beliefs about women and their role(s) in society is a key question in these women's career development.
The results of this study have important implications for career counselors and academic advisors working with young women. In particular, the significance of family-career importance in predicting career choice suggests the need for career counselors to discuss not only the worker role but also the roles of parent and spouse and how all three roles relate to certain life patterns. It appears that for young women career decisions cannot be made separately without considering other life roles. The difficulty in presenting these roles is resolving how these roles can be managed simultaneously. Value issues in terms of the mother's role in parenting and providing child care also need to be examined within the context of career choice. The fact remains that effectively managing parent, spouse and worker roles is not an easy task to accomplish.

The findings of this study also have important implications for teacher educators. Through better understanding of the characteristics that predict the career choice of elementary and secondary teaching, faculty in teacher education programs can plan more appropriately in courses to facilitate preservice teachers' learning. With respect to the significance of sex-role orientation in predicting the career choice of teaching in this study, teaching modules that include an understanding and awareness of sex-role stereotyping and
the importance of sex-fair practices in the classroom are suggested. Teaching components built into preservice teacher education programs might include information about sex-role stereotyping, the influence of sex-role socialization on human development and how sex bias occurs in the education system as well as the completion of survey(s) aimed at identifying stereotypes followed by small and large group discussions. The last component might be to provide activities for changing attitudes and behaviors (ways to become more equitable teachers, i.e., by eliminating sex role stereotyping in language, behavior and curriculum). Based on the importance of the family-career importance variable in this study values clarification exercises are also recommended. In addition, it is important that part of preservice teachers' learning includes an understanding of how teachers' values, attitudes and beliefs influence students and the choices they make.

Different from previous research on the career development of women, the researcher chose to utilize a sample of women in one occupational group instead of women interested in a variety of majors/occupations. One of the advantages to this approach was that differences in the predictive models of elementary teaching and secondary teaching could be detected. According to Book and Freeman (1986) there
is little empirical evidence of similarities and differences among elementary and secondary pre-service teachers. Utilizing a sample of women in one occupational group in this study not only provided a different way of examining the career development of women but also provided new data about the career choice of teaching. One finding from the study indicated that the odds of choosing secondary education was five to six times more likely if subjects described themselves as masculine relative to those who described themselves as feminine. In addition, results indicated that as GPA increases (per letter grade) subjects were almost two-thirds more likely to choose secondary teaching than elementary teaching. Certainly these differences would not have been found if the entire occupational grouping of teaching (both elementary and secondary teaching combined) had been utilized and compared to a very different occupational group (i.e., engineering).

While this study does not provide the necessary evidence, future research utilizing the same approach may reveal the importance of studying one occupational group in order to gain a clear pattern of important predictor variables of choice. In this study, the results show differences within the occupational group which tend to support the contention that separate career development models may be
needed for a complete understanding of the career development of women. For example, the results of this study on the career choice of teaching may be very different from research done on the career choice of pharmacy or nursing or marketing, etc. Different career development models may exist for different occupational groups.

This study utilized a methodology that is used frequently in the health sciences but is relatively new to the social sciences. The logistic regression model has proven to be a valuable way of analyzing data in which there exists a dichotomous dependent variable and a mix of both categorical and continuous independent variables. Logistic regression was successfully used in this study in determining a predictive model of career choice for elementary and secondary teaching. Future research on career choice would benefit from utilizing this particular method of data analysis when appropriate.

Recommendations for future research include a follow-up study to discover which subjects enter the College of Education and eventually enter the teaching profession. This study utilized a sample of women interested in pursuing teaching as a career who were enrolled in FEEP. FEEP provides an exploratory experience for students which
may or may not result in their entering the College of Education or becoming teachers. In order to test the validity of the predictive model(s) of career choice of teaching found in this study, the study needs to be replicated. It would also be important to test the model on different sample populations. For example, utilizing a sample of women interested in teaching who are enrolled in an urban college/university may result in a very different predictive model of career choice than the one found in this study. Similarly, based on the need to increase the numbers of minority teachers (especially African American teachers), it may be important to replicate this study utilizing a sample of African American women interested in teaching. Based on the importance of sex-role orientation in this study there is a need for further research that examines the relationship between sex-role orientation and career choice. Gaining an understanding of how the socialization process impacts choice, i.e., what are the mechanisms, who are the agents and how and when are messages transmitted is needed to plan effective intervention strategies. Future research also needs to focus on life roles for women in order to gain a better understanding of the complexity involved in managing these roles simultaneously and how career decision making is accomplished in relation to both the parent and spouse roles.
In conclusion, this study utilized a multivariate approach in predicting the career choice of teaching. Six variables important in the career development of women were chosen to predict the career choice of elementary or secondary teaching. Results indicated that sex-role orientation, academic achievement and family-career importance were predictive of career choice in this study. This study provided a different approach to studying the career development of women (by utilizing a sample of women in one occupational group) and a relatively new (to the social sciences) method for analyzing data (by utilizing logistic regression). Although the study requires replication, the research findings add significantly to the knowledge base in the career development of women as well as provide a better understanding of the variables that predict career choice of education among college women.


Eyde, L. (1962). Work values and background factors as predictors of women's desire to work. (Research Monograph No. 108). Columbus, OH: Bureau of Business Research, Ohio State University.


The Ohio State University Office of Academic Affairs. (1990). *The Ohio State University Bulletin*, 94(9), Columbus, OH: Author.


### Appendix A

**ACT: Mathematics Score Equivalents of SAT: Math Scores**

<table>
<thead>
<tr>
<th>ACT: Mathematics</th>
<th>SAT: Math</th>
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<tbody>
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<td>1</td>
<td>200-250</td>
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<tr>
<td>2</td>
<td>260</td>
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<tr>
<td>3</td>
<td>270</td>
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<td>4-5</td>
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<td>6</td>
<td>290</td>
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<td>410</td>
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<td>420</td>
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<td>20</td>
<td>430-440</td>
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<td>450</td>
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<td>22</td>
<td>460-470</td>
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<td>23</td>
<td>480-490</td>
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<td>24</td>
<td>500-510</td>
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<td>520-530</td>
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<td>26</td>
<td>540-550</td>
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<td>27</td>
<td>560-580</td>
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<td>28</td>
<td>590-600</td>
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<td>610-620</td>
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<td>630-640</td>
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<td>34</td>
<td>700-710</td>
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<td>35</td>
<td>720-730</td>
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<tr>
<td>36</td>
<td>740-800</td>
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</tbody>
</table>
Appendix A (cont'd.)

Note: There were thirty or more students at each of the ACT and SAT scores below the line shown on this table. Test score equivalents below the line are estimated to be reliable. The equivalents above the line are based on insufficient numbers of students to be considered reliable, and should be used with caution. The ACT:MT test has a range of 1 to 36, and the SAT:Q has a range of 200 to 800.
Appendix B

Attitude Questionnaire

1. Several typical career patterns are listed below. Please check the one you consider most likely for yourself:

   _____ Continuous full-time paid employment from school completion to retirement.

   _____ Full-time paid employment after school completion followed by a period of part-time employment and then a return to full-time paid employment.

   _____ Full-time paid employment after school completion followed by a period of non-employment and then a return to full-time paid employment.

   _____ Full-time paid employment after school completion followed by a period of non-employment and then a return to part-time paid employment.

   _____ Full or part-time employment after school completion for a few years then no further employment.

   _____ No paid employment after school completion.
2. Please check the statement that is closest to your own feeling regarding the relative importance of career and family:

   ____ Career pursuits are far more important than family pursuits.

   ____ Career pursuits are more important than family pursuits but family is important too.

   ____ Career and family pursuits are equally important.

   ____ Family pursuits are more important than career pursuits but career is important too.

   ____ Family pursuits are far more important than career pursuits.