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**A CAUSAL-COMPARATIVE STUDY OF THE RELATIONSHIP
OF MATHEMATICS, SCIENCE, ATHLETICS
AND THE CAREER EXPECTATIONS
OF ADOLESCENT WOMEN**

by

Elwood Martin Bowers

**A Dissertation
Submitted to the
Faculty of The Graduate College
in partial fulfillment of the
requirements for the
Degree of Doctor of Education
Department of Counselor Education
and Counseling Psychology**

**Western Michigan University
Kalamazoo, Michigan
December 1994**

A CAUSAL-COMPARATIVE STUDY OF THE RELATIONSHIP
OF MATHEMATICS, SCIENCE, ATHLETICS
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OF ADOLESCENT WOMEN

Elwood Martin Bowers, Ed.D.

Western Michigan University, 1994

The premise of this study is that high school women who complete course work in advanced mathematics and advanced science and participate in organized athletic programs will develop skills, knowledge, and attitudes that facilitate and encourage expanded options in their occupational expectations. It was hypothesized that such women would have occupational expectations that reflect a greater degree of gender integration or nontraditionality than women who do not participate in such activities. Other environmental or attribute variables such as parents' occupation, birth order, and constructs of self concept, were examined for intervening or modifying effects on the major premise.

Participants in the study were 73 eleventh and twelfth grade students from a high school located in a suburban neighborhood in the Midwest. The study used two instruments. The first was a locally prepared questionnaire that elicited the academic, athletic, and demographic characteristics of the participants as well as their career expectations. The second instrument was the Multidimensional Self Concept Scale (MSCS, Bracken, 1992) which assessed self concept both globally and in the six domains: social, competence, affect, academic, family, and physical. Academic course work was quantified

by calculating cumulative honor points. Athletics was quantified by assigning points for each year and level of participation. A summary composite score was calculated by combining academic and athletic scores. Demographic data having to do with birth order and parental occupation were distilled to dichotomous choices.

Results of one-way ANOVA indicated that women who chose integrated or nontraditional occupations scored significantly higher ($p < .05$) in mathematics, science, and in the composite of all activities than did women who selected traditional occupations. Results of t tests for independent means based on parents' occupational level showed that daughters of professionally employed parents were significantly more likely to participate in advanced mathematics and science classes as well as athletics than other women. The t test also showed that these same women viewed themselves lower in social self concept than did the daughters of nonprofessionally employed parents. Chi-square analyses of both parental level of employment and birth order were inconclusive.

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Elwood Martin Bowers

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CHAPTER I

INTRODUCTION

The Problem and Its Price

The cultural context in which women make career choices exerts more influence on the decision-making process than do opportunities in the job market (McGarraugh, 1990). The world of the 21st century will be technology intensive and the United States is underutilizing the productivity potential of a significant portion of its population, specifically women. Institutional and environmental discrimination continues to concentrate the placement of women in a limited number of occupational groups (Wiggins & Soldwedel, 1989). Both of these forms of discrimination are rooted in the way society raises its sons and daughters; and the ways in which boys and girls are socialized to the norms, mores, and expected gender-role-determined behaviors. This practice tends to short change all members of society. By the year 2005, women will make up 48% of the labor force. At the present, 58% of all women age 16 or older are part of the labor force (U.S. Department of Labor, Bureau of Labor Statistics, 1993a), a figure that is expected to rise to 63% of all adult women by the year 2000 (Wegmann, Chapman, & Johnson, 1989).

Occupations, for purposes of this study, are classified as traditional, integrated, or nontraditional. A traditional occupation may be defined as one in which 70% or more of the job-holders are of one

gender. An integrated occupation is one in which the number of job-holders falls between 30% and 70% for either sex. Therefore, an occupation in which 70% or more of the job-holders are of the opposite sex is, by definition, a nontraditional occupation for members of either gender. In spite of the real numbers in the paid work force, 80% of all women are employed in jobs characterized as traditional for their sex (McGarraugh, 1990). Occupations held traditional for women are typically regarded by business and industry as having less value than those considered traditional for males and thus have less earning power. By all projections, America's labor force is expected to grow by 24 million jobs between 1992 and 2005 (U.S. Department of Labor, Bureau of Labor Statistics, 1993b). It has been estimated that in the 1990s, five out of six of all new jobs in the paid work force will have to be filled by women, immigrants, or minorities (Hoyt, 1989). Achieving real equity in the workplace will be determined by how all children are prepared to take their place in the world of technology.

Historically, women have not had equal opportunity in the paid labor force for a variety of reasons. They have faced discrimination based upon every possible rationale: physical, emotional, intellectual, and economic. The problem is manifested by differences in values, interests, and attitudes that women (and men) hold for themselves (National Research Council, cited in McGarraugh, 1990).

Sociological factors such as families headed by single females, the rising cost of maintaining a reasonable lifestyle, and the importance of having a two-paycheck household are becoming increasingly essential. These issues all point to the need for society to create a cultural context

or environment in which every individual is afforded equal opportunity in the job market.

The wages of successful, achieving women are rising. There are 57 million working women; and of those, 10 million earn more than \$30,000 per year and 2 million earn \$50,000 or more (U.S. Department of Labor, Bureau of Labor Statistics, 1994a). In schools of law and medicine, women now make up 40% of the graduating classes. Even in politics, women have increased their numbers. In the U.S. Senate, the number of women increased from two to seven as a result of the 1992 election. With an increased presence in various legislative bodies, women are increasingly likely to win mandates supporting a more equitable work force in the future.

Considering the reality of what is actually happening, and what must happen in the future, the rigid, gender-defined roles often expected of men and women are becoming less compatible with the economic and social realities of the 1990s (Nash, 1991). Yet most men and women still aspire to and seek employment in occupations along traditional, gender-identified lines. As a result, women continue to earn, on the average, 70 cents for every dollar that men earn (Nash, 1991).

Wiggins and Soldwedel (1989) posited that, given the changing profile of the work force from that of producing goods to a service orientation wherein most of the occupations that will yield satisfactory wages are based in technology, the challenge is to increase the numbers of women who are prepared to enter them. By directing high school women towards classes in mathematics, science, and technology, counselors and educators who understand the present and projected

needs of the labor force can play instrumental roles in the economic well-being of America and women in particular.

The Causes

Underlying Factors Perpetuating Sex Segregation in the Workplace

Most young women continue to stick with tradition in their choice of careers. This fact contradicts most of what is known to be the reality of their future (McGarraugh, 1990). The majority of emerging occupations will be in the service sector, and the preponderance of those jobs will be in the lower ranges of the pay scale. Median weekly earnings for unskilled service workers in 1992 were \$232 as compared to \$489 for skilled technicians and related support workers (U.S. Department of Labor, Bureau of Labor Statistics, 1993b). Those persons not prepared to enter the world of technology or other professional disciplines, will be condemned to careers that yield low, substandard wages.

Gender-Role Socialization

McGarraugh (1990) held the notion that the cultural context in which women make career choices exerts more influence on their decision-making process than do opportunities in the job market or support from the educational institutions. The cultural context, in this case, is the manner in which people are socialized relative to gender-role identification, that is, stereotyping of expected behavior, role acceptance, conflict, or strain, and the saliency of these constructs for the individual.

Gender, or classification by sex, is the first social identity learned

by children (Mason, 1984). The precepts of masculinity and femininity, unconsciously cherished by many members of both sexes, are likely to influence and shape every decision made by men and women. It affects practically every aspect of life--social roles, family roles, and most certainly what is chosen as an occupation (Mason, 1984).

There still is a solidly rooted "bedrock" of gender-role stereotyping (Bowers, 1990; Maccoby & Jacklin, 1974; Marini & Brinton, 1984; U.S. Department of Labor, Bureau of Labor Statistics, 1993b). Education still perpetuates intrinsic barriers to women in academic and occupational achievement (Sadker & Sadker, 1994). This phenomenon seems to endure despite legislation prohibiting discrimination on the basis of sex and research and development activities aimed at combatting sex bias, stereotyping, and discrimination (Coyle-Williams & Maddy-Bernstein, 1992).

Self Concept, Self-Efficacy, and Career Choice Decisions

Self concept is one's beliefs about any number of constructs that describe himself or herself based on a set of measurable parameters or dimensions (Bracken, 1992). From these self-descriptions, inferences can be made about one's expected future behavior (Bracken, 1992). Self concept is a description of behavior patterns that children learn primarily as responses to their environment (Bracken, 1992). Self-efficacy is a construct, based on the concept of self, that describes one's expectations compared with his or her ability to perform or achieve in predictable ways. Self-esteem seems to be an amalgamation of self-efficacy into self concept in that it attempts to evaluate the quality or

"worthiness" of such self-estimations. Bracken (1992) claimed that children act upon or within six overlapping environmental domains that shape or develop their behavior patterns. These behavior patterns describe an individuals' concept of self and, as such, have predictive qualities from which one can infer future behaviors.

Self concept and self-efficacy cannot be mutually exclusive. What one believes herself capable of doing must surely be founded in what she believes herself to be. Studies (Hackett & Betz, 1981; Terlau, 1991; Whiston, 1993) have shown that typical sex-typed behaviors or dispositional traits characterized as feminine (e.g., passivity, nurturance, and deference) have an impact on women's sense of self-efficacy regarding their ability to do certain tasks. These dispositional traits have been observed and found to be related to career selection and nonselection (Hackett & Betz, 1981; Whiston, 1993). In what appears to be a secondary linkage, Nevill and Schlecker (1988) found that women's self-efficacy expectations vary according to their perception of the gender-stereotyping of a specific occupation. This, in turn, affects women's willingness to engage in traditional and nontraditional careers. Hackett and Betz (1981) argued that the concept of self-efficacy expectations is useful in explaining the underrepresentation of women in most male-dominated career fields. This argument also points out women's underutilization of certain abilities and talents related to their career pursuits.

To illustrate the point, Bardwick (1974) summarized society's historical beliefs regarding traditional female dispositional traits or characteristics. These beliefs help define and shape the concept of self for both men and women. In fact, these beliefs impinge on every decision

and virtually every aspect of both women's and men's lives:

As far as we know, throughout history and across cultures of very different characteristics, women have been expected to be the main caretakers of young children. . . . Women have been encouraged to become (and have been characterized as) forces of feelings, as sharing expectancies with each other, as predictable, as concerned with others. The emphasis for women has been on communion, contact, union, cooperation, and openness to others and one's own feelings and impulses. (p. 60)

Waite and Berryman (1985) described a linkage between self concept and career choice decisions. They contended that the major factor affecting a woman's career choice is how she perceives herself and the role she anticipates for herself in terms of marriage and parenting. Evidence from their study underscores the importance of future role perception in the career decision-making process of young women. One interesting finding from their study is that if a young woman sees herself at age 35 raising a family and staying at home or working in paid employment part time, the chances are less that she will choose a nontraditional career. Waite and Berryman also found that among those who intend to be employed full time for a significant part of their lives, women from lower economic classes are more likely to select traditional female occupations than are women from the middle and upper classes. Key to the authors' argument is that these and other issues are related to constructs of personal efficacy and self concept.

Media Impact on Sex-Role Stereotyping

The media shapes and defines cultural and personal images of self and expected behaviors. Media images of women present a contradictory and confusing picture that could serve to undermine one's own

self-image by overexposure to demeaning models of expected behaviors (McGarraugh, 1990). The National Commission on Working Women (cited in McGarraugh, 1990) pointed out significant media messages that conflict with or dispute the realities of the teenage woman:

Girls' "looks" are more important than brains. In some episodes, intelligent teenage girls are portrayed as social misfits.

Girls are characterized as more passive and less individualized than male characters.

Conversations with parents, teachers, or peers about school matters, academic interests, career goals, or future plans are almost nonexistent.

Over 90% of the teenage girls on television live in middle or upper class families. (p. 30)

Purpose of Study

The purpose of the study was to increase the body of knowledge, promote understanding of, and increase society's sensitivity to the career development needs of young women. This study attempted to discover whether certain aspects of the educational environment, which may influence children in their socialization as males or females, have any impact on young women's career expectations.

The specific variables of this study are women's participation in mathematics and science course work, organized athletics, and career choice. The study also examines constructs of self concept, parental occupation, and birth order to determine if these measures intervene in, or vary with, career choice decisions. The major contention of this study is that mathematics, science, and athletics, as independent variables, teach teenage women certain masculine-associated traits such as

assertiveness, competition, aggression, and self-assurance. These specific activities are investigated in order to determine whether they are related to any increase in the incidence of young women choosing to pursue careers from a more gender-integrated range in their selection of occupational choices.

Constructs having to do with the environment and with self concept as intervening variables are compared to both the precipitating activities and the outcome choices in an effort to discover how they may intervene in or mediate women's career decisions. The main purpose then for including these additional factors is to discover any linkage relationship that such variables may exert on the discovery of the major premises. Of primary interest is the discovery of the nature and extent of the effect, if any, that activities and experiences described as variables, influence the likelihood of adolescent women to consider occupations other than those dominated by women. Thus, if they were exposed to more experiences in these independent variables, would women have a more integrated set of career aspirations and expectations?

Focus of the Study

The focus of this study is on 11th and 12th grade high school women. Of particular interest are those women who participate in activities that emphasize or attempt to develop dispositional traits pertaining to the enhancement of one's self concept. Through this experience it is anticipated that one's sense of self-efficacy, or the set of beliefs that describe her own abilities, will expand and that such women will set and achieve higher goals. Specific activities that are investigated

for their impact on the career aspirations and expectations of adolescent women include participation in organized athletic programs and advanced course work in mathematics and science. The study uses a questionnaire to elicit information relative to school courses, athletic activities, environmental factors, and career and life plans.

The study also uses a multidimensional instrument that provides an overall estimate of self concept as a construct derived from six subdomains: family, social, affect, physical, academic, and competence. The effect of these variables are examined to discover whether any relationship shown between mathematics or science courses completed, athletic activities pursued, and career choice decisions, is linked by a similar variation in the constructs of self concept.

Need for Present Research

If the traditional patterns of sex-role socialization experienced in school limit women in terms of inhibiting their selection of occupational choices, then it should follow that teachers and guidance counselors can assist those women by helping them understand and, when found necessary, encourage changes in their occupational choice processes to include consideration of a broader spectrum of occupations, whether male-dominated, female-dominated, or integrated.

Existing theories of career choice do not reflect or satisfy present needs in the understanding, predicting, and modifying of the career development process of women (Betz, 1992; Betz & Fitzgerald, 1987; Soldwedel, 1988). Fitzgerald and Crites (1980) and Osipow (1983) contended that much has been discovered pertaining to effects of

various sociological phenomena in the research on women's career issues. Family history, birth position, parental education and occupational status, and traditional and nontraditional role-models all have been found to influence patterns of work expectations. Sex-role beliefs, sex-role-related personality traits, and traditional and nontraditional activities and experiences all affect career choice selections (Terlau, 1991).

Questions to Be Addressed

Nearly all recent research has been conducted with adult women or women enrolled in a four-year college program working towards baccalaureate degrees. Very little work has been conducted with high school-age women that will assist in identifying linkages to sex-role socialization experiences such as specific course work or extracurricular activities and occupational choice decisions. This study attempts to answer some questions dealing with the impact of specific course work and school-related experiences on career choice decisions of adolescent women. Specifically, what is the relationship between career choices and experiences in advanced mathematics and science and participation in organized athletics? Can these experiences be linked to certain variations in the outcomes of career choice selections?

If, as part of the sex-role socialization process, there are particular experiences drawn from classes taken and completed that develop and exercise certain dispositional traits characterized as "masculine," will the women who participate in these classes or activities make more integrated occupational choices? Will women who participate in organized athletics make more integrated career choice decisions? Will

women who participate only in mathematics and science course work make more integrated career choice decisions?

Research Methodology

This study examines the relationship between high school women's experiences in mathematics, science, athletics, and women's career choices by comparing the proportion of men and women that are now employed in participants' expected occupation as reported by the most recent edition of Employment Hours and Earnings: United States, 1981-1993 (U.S. Department of Labor, Bureau of Labor Statistics, 1993a).

The main operational hypotheses are that the mean standard course and activity scores and a composite score combining all of the elements considered will be different for women who select traditional, integrated, or nontraditional careers. Course scores were derived by multiplying the credits earned in a specific class in mathematics or science times the grade point based on the reported grade. Activity scores for athletics were derived by the number of athletic programs participated in times an arbitrary hierarchical score for each year involved and level of participation (e.g., junior varsity, varsity, or civic recreation program). A secondary or subtending hypothesis is that the mean scores for the six subdomains of self concept and the mean global score will vary with the mean composite course/activity score.

Research Design

The research design consists of a questionnaire (Appendix A) and a self concept assessment instrument that were administered to 73

eleventh and twelfth grade women attending an area high school. The questionnaire was used to identify the women's participation in certain courses in mathematics and science and in organized athletics as well as other demographic and background information. The survey also asked the participants to identify their current career aspirations and expectations. Finally, the survey asked participants to disclose some of their plans for preparing for their careers and to describe certain aspects of their lives as foreseen at age 35. The self concept assessment, the Multidimensional Self Concept Scale (MSCS, Bracken, 1992), measured overall self concept and six specific, component subdomains. Both instruments were administered to all participants simultaneously.

The participants who completed the survey questionnaire and the self concept assessment were sorted into three groups based on the degree of gender integration of their career choice as reported. The groups were identified as traditional occupations, integrated occupations, and nontraditional occupations. The groups were compared on the basis of participation in classes in advanced mathematics or science and organized athletics. The MSCS was administered in order to collect data regarding the participants' beliefs about themselves. The six domains of the MSCS are further defined and discussed in Chapter III.

Analysis of Data

Data collected were statistically compared by one-way analysis of variance (ANOVA) to test the stated hypotheses for equality among the sample population means. Mean scores of the independent and intervening variables were compared using t tests for two-tailed variance

between the dichotomous sets formed by parental occupation and birth order. Correlational comparisons were also used to test for relationship between the independent variables of course work and activity participation scores and the self concept scores. Finally, chi-square analysis was completed in a 3 x 2 format for occupational grouping by parental occupation and for occupational grouping by birth order.

Assumptions and Limitations

It was assumed that if any stipulated course was taken, it was successfully completed or "passed." Determination of scores was based solely on the participants' response to the item in the questionnaire that asked for the courses completed and the letter grade received. Advanced courses in mathematics and science were stipulated as those beyond that required to complete a general education curriculum and included geometry, advanced algebra, trigonometry, statistics, chemistry, physics, and advanced biology. Athletic participation was based on any involvement in any school or civic recreational sport during the grade years 9 through 12. All participants who completed the survey and assessment were counted and placed in the traditional, integrated, or nontraditional group based on their reported occupational expectation. Placement within a group was made regardless of level of participation in any of the stipulated activities or any resulting calculated scores. Nonparticipants in any of the stipulated courses or activities were entered with a composite score of zero.

The particular high school studied in this project is situated in a middle class, predominately white suburban neighborhood. There were

101 volunteers out of an available population of 210 who participated in the project. Out of those who participated, only 73 of them were accepted into the study. Those who were eliminated failed to complete certain portions of the instruments or their job expectation selections were too obscure to be able to categorize them accurately. Due to the demographics of the school environment and the relatively small sample, any attempts to generalize the findings of this project must be considered carefully.

Use of the terms traditional and nontraditional in this study are in reference to women only. Occupations that are nontraditional for women are, by definition, traditional for men. A gender-traditional occupation is one in which 70%, or more, of the job holders are of one sex or the other. In similar fashion, the use of the term integrated, in reference to an occupation, means that the gender mix of the job holders ranges between 30% and 70% for either sex. This use of nontraditional and traditional is consistent with the use of these terms in the sex-role and career development literature (Hackett & Betz, 1981).

Summary

There is clearly a need to continue to seek clues to the understanding of the dynamics of career development of young women (Terlau, 1991). Any number of studies (Hackett & Betz, 1981; Terlau, 1991; Whiston, 1993) have explored the issues of career expectations and the dynamics and delimiters of women's career choice decisions; but as Osipow (1983) pointed out, the "classic" theories of career development (Holland, 1973; Roe, 1956; Super, 1963) are insufficient

to fully explain, define, or prescribe career action plans for women. This project attempts to put one more piece in the puzzle by assisting teachers, guidance counselors, and other professionals in helping women become full partners in the present and future, technology-bound work force. If a linkage can be established between the dynamics present in the successful delivery of certain, school related activities that seem to broaden women's experiences to include characteristics that have been identified as both feminine and masculine, then the possibility certainly exists that these same dynamics can be inserted into the delivery of other school related activities and curricula. If supported, the hypotheses presented by this study and the concepts that they embrace will serve to help enfranchise women in developing their career options across the widest expanse of opportunities available.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

Chapter II includes a review of the literature pertaining to women and work. It reviews the nature of women's work from an historical perspective and follows its course from colonial times when work focused around the home and the family enterprise, to the present, when paid employment outside the home has become a significant economic factor. This chapter looks at how women's work has evolved over the years, profiles women's participation in the work force today, and reviews the trends and directions in which it appears to be heading.

Sex-role socialization issues, gender discrimination in the workplace and in school, and career development of women are reviewed in order to develop some understanding of the processes which women experience in planning for and making choices pertaining to career and family. Factors that may contribute to the perpetuation of sex-role segregation practices in the workplace are reviewed. Trends, legislation, court rulings, and executive orders affecting women and equal opportunity in the workplace are reviewed along with an overview of recent, related research pertaining to women's career choice decisions.

Key Gender Terms Related to Socialization

Mintz and O'Neal (1990) assembled the following definitions of gender-related terms that are common to both males and females:

1. Gender--classification into a group according to sex of the individual.
2. Gender role behaviors--expectations, and actions ascribed by society as being either "masculine" or "feminine."
3. Gender role socialization--the process by which people are taught about expected societal gender roles.
4. Gender role identity--the degree to which a person identifies with or displays society's definition of masculine or feminine behaviors.
5. Gender role attitude--an individual's endorsement of societal defined gender roles.
6. Gender role conflict/strain--detrimental consequences of gender roles for either the person in them or for persons associated with that person.
7. Gender role salience--the importance of gender roles in a person's life. (p. 381)

The Historical Perspective

Kessler-Harris (1981) made the following observation regarding culture and women and their role as workers:

Women have always worked; in their own homes and in the homes of others, in the fields, factories, shops, stores, and offices. The kind of work done has varied for women of different classes, races, ethnic groups, and geographic locations. The nature of women's work has changed over time with both urbanization and industrialization. That which remains the same is that the ways in which women have worked involve a tension between two areas of women's lives: the home and the marketplace. (p. 5)

Women have worked throughout history. However, as a

dominant social norm, family ethic, which formulates the societal rules that govern the nature and purpose of the family and its behaviors, has articulated the terms of women's work and family roles (Abramovitz, 1988). Family ethic as a precursor to the ideal nuclear family has been a persistent force in defining gender roles and expectations. In colonial America, women were expected to be married and economically productive. Colonial women managed the household and helped their husbands operate the family farm or enterprise by which it supported itself (McGarraugh, 1990). Women who were not the wives of farmers worked at a variety of crafts and trades, using the skills they learned from working with their mothers and with their male partners in running the family farm or business. In that era, formal training and apprenticeships were reserved for men (Wertheimer, 1977).

The practice of women working outside the home or away from the farm or family enterprise began with the industrial revolution. Women, in some cases taking their entire families, sought employment in mills and factories where they were subjected to long hours at low wages. In those days, "proper ladies" worked away from home only until they married and then they either "retired" or were dismissed. When married women, other than members of racial minorities, worked away from the home, it was usually because of their low economic status or because it was made necessary by widowhood or other circumstances reflecting dire need (Bergman, 1986).

The 19th century's dominant cultural customs, norms, and cultural beliefs, as well as laws and judicial rulings, reinforced and perpetuated women's legal, political, and economic inferiority. This patriarchal

system forced many women to orient themselves exclusively toward careers as wives and mothers and behave as the "weaker sex" in other aspects of their lives. Women were subject to laws based on the principle of coverture that established and reinforced the husband's ownership and control of all family resources, including wives' wages (Reskin & Hartman, 1986). Dismal wages and dead-end jobs convinced most women that being wives and mothers were the most satisfactory careers (Mason, 1984).

In 1850, the United States Married Women's Property Act gave women the right to be an independent economic entity; to hold jobs, to keep her own earnings, to enter a contract, and to sue and be sued (Geile, 1978). Following this, women began to win the right to enter professional occupations. The first woman physician graduated in 1849. The first woman to complete a program in theology did so in 1850, even though it was to be 28 years before she was ordained and granted her degree. The first woman lawyer graduated and was admitted to the bar in Washington, DC, in 1873 (Geile, 1978). It was in the social arena that women made the greatest inroads into male professions. During the 1840s, Catherine Beecher successfully argued that women should fill the role of school teacher in the expanding frontiers. Shortly thereafter, the gender scale of the profession quickly tipped from that of predominately male to one predominately female (Geile, 1978).

The roots of women's economic disadvantage were well established in the 19th century through a system in which men sought to perpetuate male advantage. As the industrial revolution progressed, men moved quickly to take up any jobs requiring more skill and thus holding

more value, leaving the jobs they previously had held to women. Teaching and clerical work are the prime examples of jobs that went through an occupational abandonment and succession phase wherein men left one line of work to go into another, leaving those jobs to be filled by women (Mason, 1984).

Because they arose out of "women's domains" and were not highly valued economically, social services and home economics evolved into academic disciplines dominated by women, as did nursing and clerical work (Geile, 1978). This occupational segregation continues. More than 25% of all working women are still found in low paying service and support occupations such as secretary, bookkeeper, domestic worker, health aide, and waitress (Coyle-Williams & Maddy-Bernstein, 1992).

Two world wars set the stage for eliminating the myths surrounding what women could or could not do in the workplace. World War II found women performing in virtually every conceivable job and capacity, replacing their husbands, sons, and brothers throughout industry as the men marched off to serve in the armed forces. Yet as the war ended, the dual labor force system reemerged wherein men, returning from war, reclaimed their old jobs and forced women to return to more "traditional" work. This practice continued through the 1950s, 1960s, and 1970s (Geile, 1978).

Post World War II studies involving women's career issues focused on "why" women work. In the 1950s, women who were in paid employment were regarded as psychologically suspect (Geile, 1978). Geile noted that both Margaret Mead and Benjamin Spock cautioned that women's work should center on the home. Dr. Spock even suggested

that the effect of mothers working outside of the home would likely prove harmful to children's development. For example, a Vassar study of college student career plans (cited in Geile, 1978) conducted in the 1950s suggested that career striving was a sign of uncertain feminine career identification and inner conflict.

As more women joined the work force between 1960 and 1980, the integration of occupations was characterized by a slow, but steady, migration of women into male-dominated occupations (Beller, 1984). Occupations dominated by women, however, remained essentially the same in both occupational classification and in numbers (Beller, 1984). In spite of the migration to "men's work" during the 1960s, women actually became even more occupationally concentrated. Women continued to choose the same kinds of jobs they had traditionally filled before due to the fact that so many women entered the work force for the first time (Beller, 1984). It was not until the 1970s that women began to enter nontraditional occupations at a greater rate than that of the general labor force population (Beller, 1984).

The women's movement began to gather steam in the 1970s. Most real progress, however, was made only in opening doors and increasing opportunities that catered to women with educational and professional qualifications, and who were determined to make it in a man's world (Beller, 1984).

According to Beller (1984), findings from the 1970s often are in conflict from study to study because there seemed to be no common parameters of measurement, and the data used were not equivalent or comparable. However, Beller (1984) also noted that the degree or

"index" of segregation (SI) declined at a rate almost 3 times that during the 1960s, from 68.32% in 1972 to 61.66% in 1981. The index of segregation represents the proportion of either men or women who would have to be distributed among other occupations in order to reach complete equity among sexes (Beller, 1984).

Even today, women still struggle with a cultural bias against their employment in technical jobs, in part, due to lack of experience and self-confidence in mathematics, science, and technology (McGarraugh, 1990). Women, by and large, still choose jobs that are traditional for their sex. In fact, according to McGarraugh (1990), nonprofessional women are selecting traditional occupations at about the same rate as during the entire past century.

As recently as 1990, women still only accounted for 18% of all doctors and 22% of all lawyers (McGarraugh, 1990). However, at the present, approximately 40% of the students of medicine and 50% of the students of law are women (Sadker & Sadker, 1994). Women fare somewhat better in other areas with 32% of all computer analysts and 50% of all accountants and auditors being women (McGarraugh, 1990). Women in science, technology, and skilled trades are still rare, with only 15% in all engineering disciplines. In the skilled trades, women are even more rare. For example, only 2% of all electricians are women (McGarraugh, 1990).

Interests and Values in Conflict

Role of Wife and Mother

The late 1970s and early 1980s produced a substantial body of research on women's occupational plans (Gerstein, Lichtman, & Barokas, 1988). Fitzgerald and Betz (1983) found the most salient issue impacting the career development of women to be the conflict that they experienced between the roles of wife and mother and paid employee. Marital status, the presence or absence of children, and the age and number of children that a woman has relates to both her decision to seek work and to the amount of role conflict she experiences (Read, Elliot, Escobar, & Slaney, 1988). Read et al. (1988) argued that there are significant differences in the importance of the various reasons for which women seek career goals. They contended that women with children, whether they are married or single, place more value on better employment and financial need than do women without children. Conflicting with that premise, they suggest that children are often seen to be barriers to women seeking their career goals.

Attitude of Spouse

Complicating all other issues are the attitudes of husbands towards child rearing, domestic responsibilities, and work, which can significantly impact women's career decisions. Stoltz-Loike (1992) described the two poles that a husband's attitude may approach in reference to his wife's career. At one end, the focus is on competition that may arise between two career-oriented spouses leading to marital

tension and instability (Betz & Fitzgerald, 1987). At the other end, the focus is on status maintenance or status enhancement wherein working wives support or improve the family's socioeconomic situation. Husbands' positive attitudes toward their employed wives can significantly influence the work force participation of wives (Betz & Fitzgerald, 1987). As would be expected, women who had always worked had the highest wages and most prominent positions. Reentry women, even if they were college graduates, who returned to work in their early 30s never earned as much as their peers who always worked (Read et al., 1988).

Work Involvement and Self Concept

Work involvement and self concept are interrelated (Super 1957, 1963). Self concepts differ between women who have chosen to stay at home and those who are pursuing careers after marriage (Betz & Fitzgerald, 1987). These differences can affect a woman's priority setting and personal attitudes as well as her ultimate career and family choices (Stoltz-Loike, 1992). Women who are more involved in their jobs are generally more self-reliant, self-sufficient, and have a lower need for affection and inclusion. Women who are less involved in their careers are more nurturant, responsive, dependent, and emotional (Stoltz-Loike, 1992).

Sullivan (1992) suggested that career and family issues are explained, at least in part, by the "split dream" theory. Men develop dreams that focus on careers while women tend to develop dreams that include both family and career. In the early stages of their careers,

women's dreams focus on their careers; but by their early 30s, women reappraise their dreams and the focus shifts to include family responsibilities. According to Sullivan (1992), not all women seem to experience this phenomenon. Some women, in fact, appear to focus entirely on family and motherhood, while others seem to stay focused on their careers. Those women who marry tend to find their young adult years often more stressful than do men because they are more likely to have to wrestle with decisions regarding the balance of career and family (Sullivan, 1992). Single women, whether divorced, widowed, or never married, place more importance on career satisfaction than married women (LaSalle & Spokane, 1987). In a dual wage-earning family, all members are affected by each adult's employment. Each working adult is, in turn, affected by the career demands and the family needs of the other (Stoltz-Loike, 1992).

Gender-Role Theory

Two Tenets of Gender-Based Occupational Segregation

Strober (1984) suggested that there are two central tenets of gender-based segregation in the workplace. The first is that, in general, decisions regarding the gender assignment of jobs are made by men. Men decide which jobs they will inhabit. Men set wages and working conditions, and they allow other men to decide which jobs will be theirs. The remaining jobs will be offered to women. Jobs that appear to be designed for women are those which employers may believe that men would find undesirable. Subtending this tenet is the phenomenon of

occupational abandonment and succession wherein men leave one line of work in favor of another one that might be more lucrative or challenging. Women then move to fill those jobs abandoned by men. Two clear examples of this are school teaching and clerical work (Mason, 1984).

The second tenet of Strober's (1984) theory is that in deciding which jobs to take and which jobs to leave for women, men are seeking to maximize their economic gain. Simply put, if a new job appears as a result of a technological or organizational change, men will move in and claim it if it offers superior economic gain. Otherwise, the new job will be left to women. Thus, according to Strober (1984), whether a job is stereotyped for men or women is initially a function of when, where, and how it was developed. The fact that women are economically disadvantaged is no accident of history or nature, but is a result of a system by which men seek to perpetuate male privilege (Mason, 1984).

Employers tend to view women as less stable because they assume women are more likely to take time out for childbearing and rearing regardless of their childbearing status. Because of this, women are less likely to be promoted or hired into key positions until after age 30. This, in effect, may lead women to leave the labor force, abandon their career aspirations, or take part-time work. In fact, women spend about 10.5 years less in the work force than do men (Wegmann et al., 1989).

Gender-Role Stereotypes

The construct of gender shapes the personal characteristics and self-views of both men and women through the experiences open to

them and through the nature of the interactions they have on a daily basis (Cook, 1990). Gender roles are a way of organizing the universe (Scher & Good, 1990). Until recently, it was assumed that gender roles simply described how people behaved or how they were supposed to behave. Gender is conceptualized as a principle of social organization that structures the relationships between women and men (Crawford & Maracek, 1989) and differentiates between them on the basis of sex (Cook, 1990).

Gender-role stereotypes are the beliefs that men and women of any given society hold about personality and behavioral characteristics ascribed to either gender (Davenport & Yurich, 1991). The contents of gender-role stereotypes describe the particular behaviors and other characteristics that men and women believe typify themselves as masculine or feminine (Davenport & Yurich, 1991). Stereotypical feminine characteristics have been variously identified as warmth, nurturance, sensitivity, emotionality, expressiveness, interdependence, affiliation, and compassion (Enns, 1992; S. King, 1989; McBride, 1990; Ossana, Helms, & Leonard, 1992). Counter to that, stereotypical masculine traits have been identified as independent, competent, assertive, dominant, and goal directedness (Cook, 1990; Davenport & Yurich, 1991; S. King, 1989).

Shirreffs (1975) found that both men and women tend to describe themselves in stereotyped terms. Men tend to describe themselves, significantly more frequently than women, in favorable, masculine stereotyped traits. Men's self-descriptions also contain moderate amounts of favorable feminine traits such as warmth and emotional concern.

Women described themselves only in favorable or unfavorable feminine stereotyped traits significantly more often than men.

Gender Stereotyping of Occupations

Gender stereotyping of occupations refers to men's and women's beliefs about the appropriateness of specific occupations for men or for women. Both men and women tend to agree on which occupations are best suited for men and which ones are best suited for women and thus categorized as being masculine or feminine (Soldwedel, 1988). Given permission to be anything he or she wants, children may still choose only occupations traditionally associated with his or her own sex (Miller, 1989). As a result, gender stereotypes of occupations tend to correspond to the actual proportions of men and women employed in those occupations. Gender stereotypes serve a descriptive function in that they portray men as working in predominately male occupations and women working in predominately female occupations (Miller, 1989; Soldwedel, 1988).

Family Influence

Marini and Brinton (1984) cataloged as chief among factors of gender differences in occupational orientation, the predominant influence of the family on the dispositional traits of children. Parents are the earliest and most pervasive determinants of children's career choice (Miller, 1989). Children bond to, interact with, and emulate the behaviors and traits of their parents, siblings, and other family members with strong emotional ties. Marini and Brinton (1984) claimed that very little

difference is found in the interaction and emotional support afforded by parents to either sons or daughters, yet there is a difference in the way they are socialized. Sons are encouraged to develop gross motor skills and are provided with more praise and more punishment for their performances. Sons receive more family and social pressure to not engage in sex-inappropriate behavior (Marini & Brinton, 1984). Adults make sex-typed toy choices emphasizing physical play for sons, more interpersonal, affectionate behavior for daughters. Fathers are more likely to emphasize sex-appropriate play than are mothers and they interact more often with their sons (Marini & Brinton, 1984).

Gender-Role Differences in Occupational Aspirations

According to Marini and Brinton (1984), gender-role differences in occupational aspirations are established in preschool years and are maintained through adulthood. In a national survey of 14- to 17-year-olds, 70% of all teenagers named their parents as most influential on how they felt about things like school, marriage, jobs, and having children (Crowley, 1980). In fact, Vodanovich and Kramer (1989) found that adolescent women scored higher than their fathers on two of four "traditionally male" work values (i.e., economic and mastery achievement), while scoring higher than their mothers on all four (i.e., dominance/ recognition, economic, independence, and mastery achievement). Interestingly, there were no significant differences to be found in work values between males and females.

Children tend to be less stereotyped in their sex-role attitudes if the mother is employed outside the home (Kaufman & Richardson,

1982). Maternal employment fosters career salience among daughters, particularly if the mother has a positive attitude towards her work (Kaufman & Richardson, 1982). It should be noted, however, that Hofferth (1980) found that for women who do not go to college, the gender stereotype of the mother's occupation has a direct affect on the daughter's choice of an occupation.

Daughters of single mothers may be differentially socialized from other women. These women seem to understand the need to be self-sufficient (McGarraugh, 1990). Living in a female-headed household provides a clear view of the reality of what "traditional women's work" will or will not support. There is a clear relationship between poverty and female-headed families that underscores the need to focus efforts on expanding career options of young women growing up within them (McGarraugh, 1990).

School Influences on Sex-Role Socialization

Discriminatory Practices

All over the country, schools are being studied and the evidence thus far shows that discriminatory practices towards girls exists in the amount of attention paid to them (Sadker & Sadker, 1994). Sex-role stereotyping in textbooks and in counseling students into gender-stereotyped career tracks is still the norm (Sadker & Sadker, 1994).

Gender-role stereotyping in textbooks and educational materials was recognized as a serious problem in the late 1960s. Marini and Brinton (1984) cataloged several studies conducted throughout the

1970s that documented the existence of sex stereotyping, particularly in mathematics and science materials. Nilsen (1977), in a limited study, reported a direct correlation between the degree to which children classify activities as belonging in either the male or female domain and the length of exposure to a reading program presenting highly sex-stereotyped images. Increasing public awareness and recognition of biased educational materials were expected to ameliorate the problem; however, textbooks published through the 1970s continued to portray boys and girls, men and women in stereotypical roles (Marini & Brinton, 1984). Sadker and Sadker (1994) claimed that in 1994, most of the recent history books devote only approximately 2% of the text to women.

According to Sadker and Sadker (1994), "girls are the only group who enter school scoring ahead and leave scoring behind, a theft occurring so quietly that most people are unaware of its impact" (p. 5). Sadker and Sadker (1994) claimed that from "grade school to 'grad' school, boys capture the lion's share of teachers' time and attention" (p. 4).

The Mathematics and Science Factor

In a study published by the American Association of University Women (AAUW, 1991), findings indicated that most boys and girls truly like mathematics and science and have confidence in their abilities, particularly in the early grades. However, according to the AAUW (1991), their interest declines as they get older, with the most precipitous losses occurring among adolescent women. If there is truly a

problem in this, it most likely stems from low grades. Adolescent men and women view grades in mathematics differently. Young women see low grades as a personal failure, while young men come to believe that mathematics is not useful (AAUW, 1991).

Both males and females who like mathematics and science exhibit higher self-esteem, greater career aspirations, and are more tenacious in clinging to their dreams (Kaplan & Aronson, 1994). Girls and boys who like mathematics and science are more likely to aspire to careers as scientists or science-based professionals.

In the earlier years, interest in mathematics and science is stronger for females than for males. By high school, however, the proportion has reversed to where only 29% of the females think they would enjoy a career in science as opposed to 52% of the males. Interestingly, it was found that women who like mathematics are more confident about their appearance and worry less about whether others like them (AAUW, 1991).

Efforts to invoke gender equity in the schools and classrooms are beginning to pay off in higher mathematics and science test scores (Kaplan & Aronson, 1994). Yet while their test scores are improving, many adolescent women still feel unwelcome in mathematics and science classrooms and careers (Kaplan & Aronson, 1994). Ironically, Kaplan and Aronson found that women who have completed eight or more mathematics classes in college earn virtually the same amount as their male counterparts. The gender gap in mathematics and science is not fully understood. One thing that is clear is that it has little to do with innate ability.

The Athletics Factor

There is little to be found on the subject of athletics and whether it influences career choice. Most of what has been written about women and athletics has targeted postsecondary students or adults. There are, however, some positive factors associated with women's participation in sports. One recent study (Handel, 1993) claimed that participation in athletics had a strong impact on leadership development.

White (1991) conducted a study which concluded that cooperation and competence in sports is most closely associated with positive personal and social adjustment while, on the other hand, competition, aggression, and conflict are more closely associated with negative feelings. White's findings suggested that successful women athletes place a high value on cooperation, on relationships, and on achievement in both sports and academics. Meyer-Pfaff (1990) found that women perceive competition as assisting in individual goal attainment; however, it becomes a hindrance in relationships. Cooperation, on the other hand, is perceived as assisting in group goal attainment. Kelly (1991) found that adolescent women derived more status through informal social channels (i.e., extracurricular activities with same-sex peers and boy-friends) than through academic and athletic achievement.

Historically, many women worried about the perception that sports were unfeminine (Festle, 1993). Women often resorted to "apologetic" behaviors that downplayed the importance of competition and athletic careers and strove to present a feminine appearance. The media supported conventional constructs of gender-role in their portrayal

of both male and female athletes (Buysse, 1993). Buysse contended that traditional gender-role stereotyping is deeply embedded in sports through a perpetuation of gender differentiation and a masculine hierarchy. Buysse also found that the media portrayed male athletes in uniform and in action significantly more frequently than it female athletes.

Yet Handel's (1993) study still makes a strong point by describing the contribution of organized athletics to leadership development by providing skills, knowledge, practice, and experience in teamwork and the exercise of leader character traits. If Handel's findings can be generalized, such experiences must provide a foundational basis for the contention that athletics might be a significant contributor to a positive sense of self-efficacy and competence. A positive sense of self-efficacy and competence may lead to a level of confidence sufficient to stimulate exploration beyond that which is considered traditional in the area of careers.

The question at hand, then, is what, if any, relationship is there between women's willingness to participate in organized athletics as an expression of certain values and constructs, and their willingness to explore a wider range of careers?

Other Biases

"Research is focusing on several key factors that may influence girls' curriculum and career choices: subtle bias against girls in the classroom, low self-esteem among teenage girls, and learning regimens that emphasize competition over cooperation" (Kaplan & Aronson, 1994,

p. 23). Boys not only receive more attention in the classroom than do girls, they receive a better quality of attention (Kaplan & Aronson, 1994; Sadker & Sadker, 1994).

Federal legislation specifically prohibits the distribution of funds to schools that do not comply with gender-equity guidelines including the selection and use of textbooks and educational materials. The Gender Equity Act currently before Congress proposes programs to assist girls and women in getting equal services in the classroom. This legislation provides for gender equity training for teachers and for programs to combat sexual harassment (Sadker & Sadker, 1994).

Tracking and Vocational Preparation

Tracking is the term used to describe the preparatory path that a given student follows in his or her education program (Marini & Brinton, 1984). Track placement is a mechanism that sorts students into groups on the basis of stated or presumed preferences and abilities and that has an impact on educational outcome expectancies for children. Primarily, track placement implies that a student is placed in a college preparatory program, general education, or vocational education. The general education curriculum does little to differentiate between males and females. Differentiation between sexes usually occurs in either the college bound group or the vocational education group. College bound women are more likely to pursue more integrated or nontraditional careers even though it is usually limited to the major professions (e.g., medicine, law, and accounting). There is also an increase in the number of women studying engineering and other physical sciences. However, most

college educated women tend to choose traditional careers in teaching, nursing, human resource development, communications, and similar disciplines. When women are enrolled in vocational education programs, very few are assigned to or select traditional "blue collar" programs, but rather are assigned to sex-typical programs such as business and office, child care, health aide, and similar occupations (Marini & Brinton, 1984).

More women than men are enrolled in college these days. More women than men earn master's degrees, and the number of women graduating with law and medical degrees has soared since 1970. Yet women still overwhelmingly tend to major in lower-paying fields such as education and literature (Sadker & Sadker, 1994). Only now, after much urging by state departments of education and through legislation such as the Carl Perkins Vocational Education Acts I and II, are public schools beginning to move towards gender equity programs that assess student interests and urge women to explore other career choices.

The Law and Women's Work

Legislation, Executive Orders, and Rulings in the Workplace

The 1960s and 1970s brought major rulings against sex discrimination through legislative acts, executive orders, and court rulings (Geile, 1984). Title VII of the Civil Rights Act of 1964 prohibits employment discrimination on the basis of sex, race, color, religion, or national origin. The Equal Pay Act of 1973 requires an employer to pay equal wages to men and women working in the same establishment at jobs requiring the same skills, responsibilities, and work conditions. Executive Order

11246 prohibits discrimination by federal contractors and requires affirmative action for women and minorities. The Civil Rights Act of 1991 allows women, the disabled, and religious minorities to collect monetary damages in cases of intentional employment discrimination.

Public Policy in Education and Labor

Women are being supported and encouraged to increase their career options through career education programs and are being increasingly supported by public policy. A number of legislative initiatives including the Women's Educational Equity Acts of 1972 and 1978 through the Carl Perkins Vocational Education Act II of 1990, have challenged the education industry to be more responsive to the needs of women in preparing them for the world of work. The Perkins Act II (1990) provides federal resources for vocational education. It focuses on sex equity in vocational education and encourages nontraditional enrollments. The Gender Equity Act currently pending in Congress will help equalize opportunities for women with proactive programs specifically ordained to support and encourage young women to explore and enter alternative career patterns.

The Job Training Partnership Act (JTPA) provides federal resources for employment and training. It specifically authorizes funding for basic skills and job training in nontraditional areas. JTPA also targets services to special populations including women and states that one of its major objectives is to reduce welfare dependency and increase employment earnings. The Nontraditional Employment for Women (NEW) Act (P.L. 102-235) amends JTPA to require states to set goals

for increasing the number of women trained and placed in nontraditional jobs and to evaluate their progress in meeting those goals. This legislation authorizes \$6 million in demonstration grant monies. The Women in Apprenticeship Occupations and Nontraditional Occupations Act (P.L. 102-530) authorizes the U.S. Department of Labor to provide technical assistance to employers and unions on preparing the workplace to successfully integrate women. The National Affordable Housing Reauthorization Act of 1992 (P.L. 102-550) includes a "Women in Homebuilding Provision" that enables local housing authorities to train women for home building jobs through construction or rehabilitation of housing in their communities. The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA, P.L. 102-240) allows states to spend 0.5% of their surface transportation and bridge monies on training and support services for women and minorities.

Current Situation

Proportion of the Work Force

Today, women represent a large and growing portion of the work force (National Research Council, cited in McGarraugh, 1990). The proportion of women of the total nonfarming work force has grown by 13.7% through the 1980s to 48.7% of all persons employed for wages outside the home (U.S. Department of Labor, 1993a). Between 1962 and 1990, the number of women in the labor force between the ages of 25 and 54 increased from 43% to 74%, a full 60% of the overall increase in the work force (U.S. Department of Labor, 1993a).

Still, the phenomenon of occupational segregation persists. Fully 80% of both sexes are still employed in jobs that are characterized as being either traditionally male or traditionally female. The concentration of women and men in jobs characterized by a predominance of one sex or the other has been a stable phenomenon over the years; it has not changed significantly since 1900 (National Research Council, cited in McGarraugh, 1990). The work force is still sex-segregated and women are clustered primarily in low-status, low-paying clerical, retail sales, and service jobs (Ehrhart & Sandler, 1987). Except for the "professions," women stick to occupations traditionally held by women. Women cluster around relatively low paying, service type jobs while men take the lion's share of the science- and technology-based jobs. The fact that women earn approximately 70 cents for every dollar that men earn is more a function of occupational segregation than wage discrimination (Wegmann et al., 1989).

Women in Leadership and Management Roles

The number of women executives, administrators, and managers increased by 94.7% between 1980 and 1990; but few have crashed through the "glass ceiling" (Ward-Backus, 1993). Ward-Backus cited a recent informal survey conducted by Fortune Magazine in which 201 chief executive officers from the largest companies in America had been asked about the likelihood of their company ever having a woman chief executive officer (CEO). The majority said that even 20 years from now, it would not be very likely that a woman would be picked to run their companies. The opinions gathered from the CEOs indicated that they

felt women, in general, lack the broad base of experience necessary to run a company. They said that women managers are clustered and concentrated in fields such as communications and human resources that rarely, if ever, lead upward. In the same article, Dr. Linda Wicander of Central Michigan University's Management Department is quoted advising women who want to move up in a corporation to "get out of staff positions and move into line positions that require risk taking" (Ward-Backus, 1993, p. 3F). Wicander (cited in Ward-Backus, 1993) recommended that women take some lateral moves in order to broaden their base of experience, thus making themselves more valuable to the organization.

Sociological Implications

There are numerous sociological implications pertaining to the increasing numbers of women in the work force. Women are waiting longer before getting married; the median age for women getting married for the first time is now 23 (Wegmann et al., 1989). Women have developed a greater need to achieve in the workplace and there is growing support for their achievement. Also, there is a significant increase in the real income of families when the wife works outside of the home. As a matter of fact, men's net earnings have been on the decrease for the past decade, and their wives' salaries have served to offset overall family wage losses (Wegmann et al., 1989). Families are getting smaller. In 1970, the average family had 3.4 children. By 1979, this figure had dropped to about 2.6 children; and by 1989, it was just slightly less than 2 (Wegmann et al., 1989).

One of the most significant sociological factors is the increased number of households headed by women (Hansford, 1988). Woman-headed households are characterized by lower educational achievement, higher unemployment, lower earnings, and more dependent children compared to other groups (Hansford, 1988; Mahler, 1989). The median income of families headed by women is only 38% of that of intact families. Even so, the desire of single mothers to be self-supporting is strong (Mahler, 1989). They derive significant psychological benefits with any material gains they experience. Mahler maintained that solo parents strive to alter their conditions of employment in order to accommodate the needs of their families. Single parents of both sexes are found to be more "agentic" in their behaviors than are married parents of either sex. "Agency" is defined as a cognitive focus on getting the problem solved or the job done, and it includes the values of independence, self-assertion, and rationality (Mahler, 1989). Agentic behaviors work directly on the environment or context in which they exist. Therefore, such behaviors have the ability to alter the environment or context to the benefit of the initiator. Agency may, in fact, be one of the factors that link other socialization experiences to key outcomes such as career choice selection.

While there may be any number of barriers confronting women trying to implement careers, they seem to boil down to primarily sex-role stereotyping and value conflicts (Osipow, 1983). There seems to be few documented, gender-related differences in abilities that would impose real barriers to women's career development.

Work Force 2000

In his overview of career issues in the 1990s, Hoyt (1988) made several significant points that impact directly on the career development of both men and women:

1. Skill levels required for occupational success will increase in both content and complexity of jobs as they are modified by technological change.
2. Nearly 70% of the 21 million new labor market entrants will be women, immigrants, or minorities.
3. Women, immigrants, and minorities in today's labor force are underrepresented in those occupational areas experiencing the most growth and overrepresented in those areas experiencing the least amount of job growth.
4. Women and minorities are presently less well prepared for occupational success by the existing education system than are white men.
5. Minority youth and family households headed by women under age 25 are likely to find employment problems greatly compounded by the fact that they are poor. (p. 33)

As in the past, women in the labor market will be more subject to the shifts in productivity and demand for workers than men (McGarraugh, 1990). However, with a shortage of skilled workers projected for the next century, women are going to become a more vital resource in the labor force.

Assuming Hoyt (1988) is correct in his projection for the 1990s and beyond, the impact of the changing sociological nature of the culture (i.e., more single-parent households, more woman-headed households, a greater proportion of immigrants and minorities in our society), the changing role of women in our society is the most significant change in this century (Jamieson & O'Mara, 1991). With women entering or

reentering the work force in increasing numbers and at every stage of their lives, it is becoming increasingly essential for them to be counseled into classes and programs that will prepare them for the entire spectrum of jobs, from high technology on the information highway to jobs in more traditional areas that are demanding increasing use of technology.

Jamieson and O'Mara (1991) have described several implications that are suggested by these trends. Men and women will work together in every conceivable arrangement; as peers, in boss/subordinate roles, collegial relationships, men working for women, and women working for women. More women will enter the executive ranks. More emphasis will be placed on the family. Organizations will develop different management styles and different perspectives on what constitutes success. In the total compensation package, benefits may vary among women who head single-parent households, women who are part of a dual-income family, and single women who are childless. Policies regarding parental leave will be revamped beyond that mandated by the Family Leave Act recently enacted. Provisions will be made for child care, elder care, and family-related activities and emergencies. There will be an increase in the concept of flex-time, shared-time, and work-at-home jobs. Regardless of the field, traditional or nontraditional, women are going to need access to all kinds of jobs that will meet their personal needs for growth and achievement and by which they can support a family, in proportions equal to their numbers (Soldwedel, 1988).

Perpetuation of Work Force Segregation

Career Development

Women's career development is more complex than that of men (Betz & Fitzgerald, 1987; Fitzgerald & Crites, 1980; Osipow, 1983). Social learning theory suggests that sex-typed behavior arises in the environment and not in the organism so that relatively rapid changes could occur if learning conditions were altered. Sex-role learning is assumed to take place continuously throughout adolescence and young adulthood, although the majority occurs during early childhood (Marini & Brinton, 1984). Cognitive development theories, on the other hand, are based on processes (changes) that are ongoing based on a child's concept about masculinity and femininity or sex-role appropriateness. Under this concept, changes in sex typing are assumed to go hand in hand with developmental changes in cognitive processes, and sex-role socialization is a product of both organismic and environmental factors (Marini & Brinton, 1984).

Other theories suggest that sex segregation in the workplace is a result of both artificial restriction and choice (Nevill & Schlecker, 1988). Historically, there have always been discriminatory limits placed on women and the kinds of work they were allowed to do (Blau, 1984). Nonetheless, both women and men have traditionally selected careers based on stereotypical gender role concepts (National Research Council, cited in McGarraugh, 1990). Bielby and Baron (1984) argued that sex segregation exists and continues to flourish due to the fact that women choose to work at "women's work." It is also argued that employment

in women's work preserves women's sense of femininity and is the key component of the "status attainment" theory. This theory suggests that women's own behaviors, values, aspirations, attitudes, sex-role expectations, educational credentials, and interrupted work histories are seen as causes of their occupational designations (Strober, 1984). These two positions ignore the case for discriminatory practices and restrictions.

Fitzgerald and Crites (1980) argued that traditional career development theories are necessary but insufficient to explain the career development needs of women. Osipow (1983) claimed that enough substantial difference exists to warrant attempts to develop distinctive theories for each gender. Osipow contended that this point will be valid at least until such a time as true sexual equality of career opportunity exists and the results have permeated all levels of society. Convincing evidence exists that social, cultural, and organizational variables influence women and men differently in their careers (Betz & Fitzgerald, 1987). Osipow (1983) warned, however, that there is so much social change in the area of sex and vocation that any theoretical proposal made in the near future may be premature, as would any generalizations about women's career development.

Sex-role differentiation is the gender-based division of labor that exists in all societies and forms the basis for many of the sex differences in behavior, attitude, and personality that are transmitted by sex-role socialization. In industrialized societies, the division of labor between home and the marketplace has important implications for the occupational orientation and preparation of the sexes prior to entering the job market. Men are expected to support the family financially, and women

take the major responsibility for home management (Marini & Brinton, 1984).

Barriers to Achieving Occupational Equity

Barriers inhibiting entry of women into nontraditional training and employment are complex and interrelated (Rea-Poteet & Martin, 1991). They are present in the social/cultural context in women's socialization to traditional roles. They are represented by unsupportive family and friends and negative attitudes of classmates and co-workers. They are manifested by lack of self-confidence or assertiveness, the lack of women role models, and limited experience with technology, tools, and mechanical operations. Women face discrimination in hiring, firing, and promotional practice as well as a general lack of support and, as is often the case, a hostile environment of isolation and harassment (Rea-Poteet & Martin, 1991).

Environmental Barriers

Because of sex differences in educational background and experience, women have not learned basic craft skills. They have not had high school shop or trade school classes, military experiences, or just "tinkering" around cars with their fathers (O'Farrel & Harlan, 1984). Comparing the experiences of nontraditional employees in 10 utility companies, Meyer and Lee (1978) found that women in blue-collar jobs needed job specific training while those in white-collar jobs did not. The background and experience of most women does not provide a well grounded foundation in basic mechanical skills, terminology, material recognition,

or tool identification. The basic competence of women to do nontraditional jobs affects their initial acceptance and ultimate pace of integration (Meyer & Lee, 1978).

Self-Imposed Barriers

Rapoza and Blocker (1976) described the "Cinderella effect" also known as "waiting for the glass slipper," a phenomenon associated with the socialization of some women wherein they assume that someone or something will come along and take care of them. Rea-Poteet and Martin (1991) found that female students were 3 times less likely to report an educational or vocational plan than were male students. Junior and senior high school women were more likely to explore traditional family-rearing options than were young men of the same age.

Statistical Discrimination

Rosenfeld (1984) claimed that because of the likelihood that women will marry and take time off to bear and raise children, they are considered a high risk group in terms of a long-range employment commitment. Some employers are unwilling to risk losing their training investment by hiring members of that group. Based on this argument, there is discrimination toward women whether they do or do not have children. Rosenfeld (1984) called this "statistical discrimination." In as much, women are systematically screened from certain male-stereotyped jobs and all the federal interventions in the form of contract compliance regulations enacted during the 1970s appear to have had little or no impact on sex segregation in the workplace (Cain, 1984).

Physical Attributes as Barriers

Block (1976) confronted the argument that women are not physically as strong as men and might therefore be excluded from certain types of work. Block's (1976) study found that the significant physical differences between men and women served to favor both sexes in one way or another. Men had greater upper body strength, leg strength, and gross coordination. Women, on the other hand, had greater fine finger dexterity, heat tolerance, and overall endurance. Block found evidence to suggest the existence of some sex differences favoring men in quantitative and spatial abilities, and favoring women in verbal activities. In general, however, research to date permits few definitive conclusions to be drawn about the existence of sex differences in either native abilities or potential for occupational development (Block, 1976).

Meanwhile, Geile (1978) argued that what has been traditionally categorized as women's weaknesses may, in fact, be women's strengths. By sidestepping the issue of physical strength, she suggested that in the context of the "nature of the world," the values which women stand for (e.g., cooperation, mediation, facilitating, peacemaking, and openness to learning) might appear quite different if given more emphasis in society.

Related Research

Self-Efficacy

Career selection is linked to perceptions of self-efficacy expectations (Hackett & Betz, 1981). Therefore, any discussion of current

research relevant to the career development of women would not be complete without some understanding of Bandura's (1977) theory of self-efficacy. This model has formed the basis for much of what has been done in the last decade relative to women's career choice decisions and how they are formulated. Self-efficacy refers to a person's expectations of their own abilities to perform or complete behaviors or tasks in any given situation (Bandura, 1977). Bandura's theory posits two key points: (1) self-efficacy mediates between human knowledge and action, and (2) specific types of experiences convey different kinds of information about competence that leads to predictable effects on one's self-efficacy.

Self-efficacy is a cognitive process that correlates knowledge about a behavior or task and one's belief about whether he or she could carry out the behavior or task correctly. Any given person may know the process or steps to complete a task or perform a behavior but may or may not believe themselves capable of doing it (Bandura, 1977). Bandura stipulated that self-efficacy is not a global personality tendency, but is specific to particular coping behaviors and is situationally founded. Compared with constructs of self concept that may include cognitions about general competence, self-efficacy is a predictor of specific behaviors to be expected in specific situations whereas self concept describes one's beliefs about one's self in a variety of domains that may or may not include the ability to perform a certain act.

Self-Efficacy and Career Choices

Betz (1992) described the role of self-efficacy and its impact on a woman's career choices. The author contended that a woman's own perception of what she can or cannot do alters (and often limits) the choices that she will make regarding her career. Women often must first overcome or resist the urge to indulge in avoidance behaviors that limit their choices. Avoidance behaviors include not taking advanced mathematics and science courses for fear of being unable to perform well. It includes not exploring career interests because they threaten one's perceived identity. When women do select options that are nontraditional, in order for them to achieve success in their choices, they also must overcome sometimes "chilly" or, at best, "null" institutional climates or educational environments in order to do so (Betz, 1992).

Whiston (1993) studied the type and degree of self-efficacy of women as it pertains to work. She found that women have a lower sense of self-efficacy, as a group, for work related to the manipulation of objects (things). Activities such as these are typically stereotyped as masculine. The supposition that sex-role stereotyping of tasks is consistent with Hackett and Betz's (1981) argument that career selection is linked to perceptions of self-efficacy expectations.

Whiston's (1993) research revealed that there are significant differences between the self-efficacy expectations that women hold regarding their ability to perform nontraditional and traditional tasks. Women are inclined to select occupations that are related to dealing with people rather than those related to working with things (Whiston, 1993).

Women represent 79.9% of all administrative support workers and only 8.1% of precision production, craft, and repair workers (U.S. Department of Labor, Bureau of Labor Statistics, 1994a). Women comprise the vast majority in health-related technologies (84.3%) and financial records processing (89.4%). At the other end of the scale, women account for only 26.6% of operators, fabricators, and laborers; 15.8% of physicians and lawyers; 5.8% of all engineers; and 20.5% of the natural scientist occupations (U.S. Department of Labor, Bureau of Labor Statistics, 1994a; U.S. Bureau of the Census, 1993).

According to Hackett and Betz (1981), men and women select occupations based on sex-role socialization experiences and the degree and sense of self-efficacy that results from such experiences. Women often lack strong expectations about themselves in many career related behaviors. This concept of self-efficacy expectations may serve to explain the distribution of job roles between the sexes resulting in a heavily sex-segregated work force (Hackett & Betz, 1981). Nevill and Schlecker (1988) found that willingness to engage in nontraditional careers was directly related to women's expectations of self-efficacy. The implication is that a woman's likelihood of selecting a "blue collar," skilled trade occupation will be limited by low expectations in self-efficacy.

Sex-Role Stereotyping and Career Self-Efficacy

Betz and Hackett (1986) argued that sex-role stereotyping of a task or activity is a major determinant of gender difference in self-efficacy. Studies of self-efficacy relative to mathematics suggest that

sex-role stereotyping of the activity may explain gender differences found in mathematics achievement.

Whiston's (1993) work suggests that sex-role stereotyping may not only be a determinant in gender difference in self-efficacy, but also may be a determinant marking the difference between women who enter traditional and nontraditional occupations. Traditional sex-role socialization causes women to develop high, strong self-efficacy for traditional occupations and low, weak self-efficacy for nontraditional occupations (Terlau, 1991). Thus, following Terlau's argument, sex-role socialization drives self-efficacy with the result that women will choose traditional over nontraditional occupations (Terlau, 1991). Terlau studied the effects of career self-efficacy and sex-role beliefs on the nontraditionality of women's occupational choices among 144 female undergraduates. She found a positive correlation between the degree of nontraditional self-efficacy and nontraditional career plans. The career self-efficacy literature is supportive of the conclusion that most women develop a level of career self-efficacy (Terlau, 1991).

Socialization Into Male-Dominated Occupations

According to Terlau (1991), a moderate level of career self-efficacy is required in order for women to choose even traditional occupations. Enhancement of self-efficacy may or may not influence women's choice of traditional or nontraditional careers. Yet increases in nontraditional sex-role socialization does seem to increase career self-efficacy and, thus, influences women's selection of nontraditional career choices (Terlau, 1991).

Underrepresentation of women in the physical and natural sciences has led to research on gender gap in mathematics achievement as a factor hindering women from entering engineering (Eden, 1992). Eden's study, differing somewhat from that reported by the AAUW (1991), found that women are almost equally represented in mathematics course work. As such, Eden made the assumption that mathematics is not the only factor that influences women's occupational choice, and that women have difficulties stemming from the characteristics of the workplace rather than the content of the career discipline.

Pricken (1989) studied the gender differences in mathematics and science majors, career choices, and three cognitive variables (mathematics self-efficacy, perceptions of the value of mathematics, and attributions for mathematics and science performance) among mathematics-science oriented college students. Results indicated that women aspired to more traditional, less mathematics and science oriented career choices than men. However, there were no gender differences in the cognitive variables. Additional findings revealed that the perception of the value of mathematics was a fairly consistent predictor of mathematics-science career choices. Pricken concluded that even though perceptions of the value of mathematics influenced career choice, in general, the cognitive variables investigated did not explain women's underrepresentation in the fields of mathematics and science. Instead, the influence of sex-role stereotypes, gender composition of an occupational field, and outcome expectations were identified as likely restrictors of women's mathematics and science career choices (Pricken, 1989). From Pricken's study, one might conclude that self-efficacy measures are not particularly useful in predicting career choices.

Self Concept

Self concept focuses on one's referential opinion of himself or herself as a person. Self-efficacy is a construct founded in self concept that defines a person's expectations for their own ability, performance, or behavior in any given task or duty. The traditional models (Harter, 1983) use a hyphenated term, "self-concept," which implies that there is a structure within the individual that functions as an "executive entity" controlling the individual's various self-functions. Bracken (1992) took a behaviorist perspective of "self" rather than supposing that one's "self" is an entity or structure within the individual. Bracken described "self" as a

pattern of behavior that is sufficiently unique to an individual to be identified with that individual. Hence we infer people's self concepts by their unique patterns of behavior. Individuals make descriptive and evaluative personal statements that reflect their past experiences and predict their future behavior. (p. 3)

Bracken's (1992) instrument, the Multidimensional Self Concept Scale, is used to assess self concept of the participants.

Early scales of self concept were unidimensional and global in nature (Bracken, 1992). That is, one's opinion of one's self was just that. These early scales did not take into account one's environment or his or her interaction within it (e.g., social, physical, academic, and cultural) (Bracken, 1992). More recent views have settled on a multidimensional construct and even suggest a hierarchical structure with contributory, intercorrelated, yet independent, subdomains with "general" self concept forming the apex and the other various dimensions comprising a second foundational tier (Bracken, 1992).

When Bracken, Bunch, Keith, and Keith (1992) compared five different self concept instruments, they found evidence of strong global self concept factors in each of the five scales. However, Bracken et al. suggested that, because the foundational subdomains within each of the instruments are found in varying degrees in all the instruments, their findings provide strong support for the hierarchical nature of self concept. Indeed, collectively, the instruments provide strong support for six foundational, context-dependent subdomains. "The construct of self concept appears to be multidimensional and is represented by six strong factors: Social, Competence, Affect, Academic, Family, and Physical" (Bracken et al., 1992, p. 8). Bracken et al.'s study suggests that any evaluation of the influence of specific program interventions on any given dimension of self concept is not only viable, but that any other approach might be less than conclusive. Interventions often fail to bring about improvements in global self concept. The major contention here is that global self concept is not sufficiently sensitive to specific treatments. Domain-specific interventions, however, can and will yield variations in domain-specific constructs of self concept (Bracken et al., 1992).

No work that discusses self concept in relationship to career development would be complete without noting the seminal studies conducted by Super (1957, 1963). He contended that a person's career choice is his or her actualization of self concept. That is, a person will select an occupation that is consistent with his or her own perception of self and reject any that are not. Further, the author suggested that the more stable one's view of self, the more accurately one's career choice

will reflect that self-view. Finally, this consistency between self concept and career choice will contribute to the long-term stability of, and satisfaction with, the choice (Super, 1957, 1963).

A major emphasis of the present study is to attempt to demonstrate this phenomenon concerning the treatment of data relative to participation in mathematics, science, and organized athletics. In fact, one of the major premises of this study has to do with the notion that variations in the environmental circumstances in which people find themselves will create or establish a frame of reference in terms of concept of self and will impact important life choice decisions in a significant way.

In a study of self-esteem, vocational identity, and career salience in high school students, based on Super's (1957, 1963) theory of life span career development, Munson (1992) took the viewpoint that one's career is a series of work and nonwork roles that people play out across a lifetime. Results of his study indicated that students with high self-esteem scored significantly higher on vocational identity and career salience than the students with low self-esteem. It was Munson's contention that knowing what one wants to "become" and how important that knowledge seems to be to the individual appears to be related to self-esteem. High or low self-esteem was established simply by the relationship of any individual score to the mean of the sample group. Those scoring above the mean were said to have high self-esteem. Those scoring below the mean were said to have low self-esteem. What was not sought or discovered in this study, however, is any relationship

to self-esteem with the kinds of career selection choices made by an individual.

Trends

Geile (1978) posited the argument that change in the status of women, with respect to paid employment, will not come about so much as a result of affirmative action as it will through the restructuring and reconfiguring the whole system of transcendent values to one that expresses complementarity and interdependence rather than priority and social hierarchy; a restructuring of sex roles as epochal as the industrial revolution. In short, affirmative action is not a viable long-term answer (Blau, 1984). A new division of labor is required in order to effectively change the nature and profile of the labor force and the status of women. Women who are now between the ages of 15 and 30 years will define and shape the issues and roles of women in the work force of 2000 (Saveri, 1991).

According to Sadker and Sadker (1994), college women set their educational sights higher than men. More than 66% of women college freshmen plan to earn advanced degrees, compared to 63% of the men. More women are planning to pursue medical, law, or doctoral degrees; a record of 27.3% women compared to 25.8% men. These figures pertaining to the percentage of women striving for the highest educational degrees have tripled over the past 25 years.

Gerstein et al. (1988) studied the occupational planning of adolescent women and compared it to that of their male counterparts. They found that there has been a significant shift in women's career plans in

some, but not all, areas. Between 1972 and 1980, there was an increase of 4.7% of high school senior women who had plans of entering occupations in male-dominated professional fields. Also, there was a 12% decrease in plans for entering occupations in clerical, sales, and service fields. More women are being trained and encouraged to take jobs traditionally held by men (Stewart, 1989). With 56% of women whose children are under the age of 6 now in the paid work force, women high school students need to become more aware of the increased earning potential associated with integrated or nontraditional careers. Despite efforts afforded to improving sex equity through legislation, most vocational programs, with the possible exception of graphic arts and marketing education, still attract students of primarily one sex or the other (McKenna & Ferrero, 1991).

Summary

America is moving toward a more differentiated society. The traditional tasks of men and women are being broken down into components that are more easily exchanged across sex boundaries (Geile, 1978). Women are exhorted to become more competitive and assertive, men are encouraged to become more nurturant and facilitative. There is a realignment of values taking place that may result in a liberation of both men and women from societally imposed gender roles, roles that essentially imprison them in their own masculine or feminine mystique. It is an argument for unity rather than differentiation and competition (Geile, 1978).

Women's career issues are complex. They are far more complex

than those that men face in choosing their careers. The fact that women have always worked is an understatement. They have worked in the home, the family enterprise, and the marketplace. What women commonly experience in connection with paid employment outside the home is a certain amount of tension between the demands of whatever career they might pursue and the responsibilities thrust upon them regarding home, motherhood, and their socialization experiences.

Times and attitudes are changing. Barriers are falling, and frontiers are moving outward in so far as women and careers are concerned. Women are found in virtually every occupational field in growing numbers if not always in growing proportions.

The labor market is changing. It is becoming more and more technology driven. The marketability of skills across companies and industries is mandated by competition in the marketplace. To be able to earn a living wage and support a family, workers have to be able to do things that require skill and provide value to the organization. No job is safe from obsolescence. Workers today, and in the foreseeable future, need to understand that in order to have a "safe" career, one must adapt to a strategy of life-long learning. Traditional women's work is being subjected to more and more automation and, even though the labor force growth is slowing as the American labor market comes down off the baby boom, the fastest growing job categories are in low paying service occupations that will not suffice in supporting one person with any degree of comfort, let alone a family. In spite of all kinds of antidiscrimination legislation and public policy supporting dozens of initiatives to persuade women to consider more integrated or nontraditional career

fields, it remains that the major increases have only occurred at the professional levels, while the proportion of women employed in technical occupations and the skilled trades still hovers around 3% or less. The answers must lay in the socialization and empowerment processes experienced during childhood and adolescence. The gist of this study is to peel off one more layer in the discovery process, looking for key factors that drive the socialization processes and what relationship that has to career choice decisions.

As the job market shifts more and more towards one based on providing services rather than producing goods, the preponderance of new jobs will be in the service sector and of those jobs in the service sector, the majority of them will be at the lower end of the spectrum in both technology and pay. Historically, these are jobs such as retail sales, personal services, restaurant work, and the like, often filled by women and first-time workers and, as such, command the smallest salaries.

Other service occupations, based in science and technology such as health care, electronics, and communications, are commanding high wages and are highly marketable and transferable within and among a large variety of industries. These higher paying jobs, whether in the service sector or the goods producing sector, have the fundamental common ground of technology. Technology is founded in mathematics and science. In order to be competitive in the job market, people will need a high school or college transcript that includes a solid academic background that will position them to take their proportionate share of the higher skilled, better paying occupations.

In spite of any number of initiatives exhorting all students to become all that they can be, both males and females still tend to select careers that are predominately made up of members of their own sex. While this, in and of itself, is not necessarily inappropriate or inherently wrong, given the nature of today's labor force, the changing profile of the economic base of American industry, and other cultural and sociological changes taking place, American women may be destined to remain second class partners in the job market if this phenomenon persists.

This project takes an in-depth look at the specific socialization dynamics of certain secondary school courses and activities as they impact on career choice decisions. It reviews family of origin factors and several constructs of self concept on women's selection of occupations.

CHAPTER III

DESIGN AND METHODOLOGY

Introduction

Chapter III includes a discussion of the research methodology employed in this study. Specifically, it describes the premises and states the hypotheses that form the basis of the research questions. Prior to that, however, the project site, the population, the subjects, the selection process, and the data collection methods employed are described in detail.

Project Site Profile

Participants were drawn from a suburban high school in a predominately white, middle class residential area of a Midwestern city of approximately 55,000 people. Present school enrollment in Grades 9 through 12 is 960 students. The school year is organized into two traditional semesters with 9-week grading periods. Students are required to successfully complete 22 credits over 4 years to graduate. All courses are considered equivalent and class ranking is computed using all letter grades from Year 9 through 12. The certified staff consists of 55 teachers, 4 guidance counselors, 1 librarian, and 4 administrators. The high school has been accredited by the North Central Association of Secondary Schools and Colleges since 1929.

The school is presently involved in the North Central Association's

Outcomes Accreditation process, being guided by an in-house committee co-chaired by two members of the teaching staff. Committee goals for the current year are focused in the areas of student outcomes in communication, technology, student self-esteem, and diversity sensitivity.

The 1993 graduating class performed slightly above state and national averages on the American College Test (ACT), with a composite mean score of 21.4. In May of 1993, 20 students took advanced placement tests in seven subject areas. Tests were given in biology, chemistry, French language, calculus, U.S. history, English language, and government. Students scoring a 3, 4, or 5 on the tests were eligible for college credit in the subject area. In total, 33 tests were administered out of which 23 scores (69%) were 3 or higher. Women students (15) achieved an average score of 2.86, while men students (5) had an average score of 3.5.

Members of the class of 1994 and 1995 have been taking the Michigan Educational Assessment Program (MEAP) tests for the past 2 years. Students must pass tests in the areas of mathematics, reading, and science in order to qualify for a state endorsed diploma. At the end of the 1992-93 school year, the percentage of students passing the test was 79.5%, 90.8%, and 90.5% for mathematics, reading, and science, respectively, for the class of 1994. For the class of 1995, 70.8% and 80.7% passed the tests for mathematics and reading, respectively. Science tests are administered beginning with the junior (11th grade) year, and the other two tests are administered in the sophomore (10th grade) year with retakes allowed in the following year.

In the second semester of 1992-93, 60 students received all As.

One hundred and sixty students achieved grade points between 3.60 and 4.00, and 233 students earned grades between 3.00 and 3.59. Slightly over 40% of all students at the high school were named to the honor role for the second semester. Out of 220 graduates in the class of 1993, 114 (51.8%) received some form of recognition for academic achievements or performance in a particular program. Over the past 28 years, the school district has maintained a consistent dropout rate averaging only 7.1% from 9th grade to 12th grade. Parent-teacher conference participation ranges from 60% to 65% for the fall term, and between 50% and 60% for the spring term. Average daily attendance for last year was 95.6% with 75 students achieving perfect attendance.

The high school is presently developing innovative programs in both curriculum content and delivery methods in several course areas. In addition to an honors program in English, all students are invited to participate in a summer leadership camp for staff and students. The camp experience provides an opportunity to explore issues of importance to both the school and to the students.

During the summer of 1993, 70 students and 10 staff members attended the camp on a voluntary basis. Four areas were identified for emphasis or development during the present school year. The areas are communication (staff and student), school spirit, new student orientation, and leadership camp planning for 1994.

All of the 11th and 12th grade women received an informational letter (Appendix B) and 101 students volunteered for the study and completed the necessary consent (Appendix C) and assent (Appendix D) forms. Of those participants who filled out, or attempted to fill out, the

questionnaire and assessment forms, 73 were accepted and 28 were rejected. Nineteen of the participants' instruments were rejected due to lack of specificity of occupational expectations to the extent that the job could not be clearly identified and categorized as traditional, integrated, or nontraditional. Four participants failed to complete one or more parts of the instrument, and five failed to indicate any occupational expectations.

All of the subjects were regular education students. Seventy of the students were Caucasian, one was African-American, and two were of Asian-American origin.

The Study

This is an ex post facto examination of socializing events and activities experienced by high school women. As such, it is one in which it is extremely difficult to establish a causal relationship between the independent and dependent variables. What takes place is the discovery of events or outcomes that seem to occur in some semblance of a relationship (i.e., when "this" factor is present to some degree, then "that" factor also seems to exist to some degree). What cannot be said with any degree of certainty is that "this" factor caused "that" factor or vice versa.

The design of this study also includes measures of self concept, the level of parental occupation, and birth order. These separate measurements are an attempt to discover what, if any, environmental or situational variables intervene with or contaminate the findings relative to the major hypotheses.

In this study, the occupational aspirations and expectations of high school women are compared by level and amount of participation in organized athletic programs, and courses completed in advanced mathematics and science. Mathematics and science are examined because of their obvious link to technology. Participation in athletics is examined in an attempt to discover what, if any, such participation correlates with the level of integration of selected occupations.

Individual level or amount of participation in these voluntarily selected activities and courses will be compared to three categories of occupational integration by gender (traditional, integrated, and nontraditional). Constructs of self concept, a comprehensive or global score and six subdomains, are also compared amongst the participants of each group. Birth order and whether or not parents hold professional level occupations are compared to the three occupational categories. Professional and nonprofessional employment is differentiated by whether or not the nature of the occupation mandated a college education and professional level preparation. Examples of professional occupations, in this sense, include certified public accountant, lawyer, physician, scientist, engineer, and teacher or professor. Finally, future life plans and family plans are described and reviewed.

The participants' occupational expectations are sorted by the degree of participation by each sex and are categorized as traditional, integrated, or nontraditional. An arbitrary division of gender traditionality is selected at 30% and 70% of the jobholders, which means that if 70% of the job holders are of the same gender, the occupation is traditional for that sex. That also means that the other 30% (or less) of the job

holders are of the opposite gender and that the occupation is nontraditional for that sex. For all other occupations, both genders of the job holders fall between 30% and 70% and are classified as integrated.

Data Collection

All 11th and 12th grade women were invited to participate by means of an oral introduction and announcement during a special assembly called for the purpose. In addition, an informational letter (Appendix B), consent form (Appendix C), and assent form (Appendix D) were sent home to the parents describing the project and seeking permission for their daughters to be a part of the study population. Also, the research associate attended the parent teacher conferences in order to be available to provide additional information to parents regarding the project.

All the women having parental consent to participate were surveyed using a questionnaire that solicited information about their experiences, demographic information, and career and life plans. The questionnaire asked for specific course work completed and grades achieved in mathematics and science and what, if any, sports and the level (i.e., varsity, junior varsity) of participation in both school settings and in community recreation programs. Participants were asked to list six careers that they might aspire to and, in addition, what career they really expected to pursue. Finally, they were asked to respond to a number of items that sampled, in simple terms, their plans in reference to work and family.

Selected participants completed the locally prepared questionnaire

and an assessment of self concept using the Multidimensional Self Concept Scale (MSCS, Bracken, 1992). The cover page of the MSCS was covered so that no identity data were collected. Participants were sorted into groups according to the occupations they actually expected to enter and the particular category into which that particular job fit (i.e., traditional, integrated, or nontraditional). The data obtained from the questionnaire yielded raw scores which were then converted to standard or T scores with a mean of 100 and a standard deviation of 15 so as to compensate for differences between 11th and 12th grade participants. The MSCS yields a raw score in each category that is converted to standard scores from a table included in the manual (Bracken, 1992). Means of all the standard scores were then compared within the various specific measurements of both instruments and across the three dichotomous groups. The data were analyzed to determine what, if any, relationship might exist between the amount and level of school-related activities and the category of the participants' occupational choice. Mean scores of "global" and six specific domains of self concept were also compared to the educational-environmental experiences of the women and their stated career expectations.

Assumptions and Premises

Assumptions

It is an assumption that career aspirations and expectations of high school students are, at least in part, a function of sex-role socialization, and that sex-role socialization is, to some degree, part of

the environmental process or system in which children are raised and educated. Therefore, variations in the environmental system should cause similar variations in expected sex-role socialization outcomes, including occupational choice outcomes. Thus, if a man or a woman is socialized in a more integrated way, in so far as dispositional traits and characteristics are concerned by taking classes in mathematics and science and participating in organized athletics, then one would expect to find a more integrated set of career aspirations and expectations for that person.

Career aspirations, as used in this study, are defined as the ideal or "daydream" jobs one might like to have. Likewise, job expectations are defined as specific occupations that a participant truly believes she can pursue given her own abilities, dispositional factors, and perception of real and available opportunities.

Premises

The environmental system has historically taught women to be submissive rather than assertive, nurturant rather than authoritative, deferent and competent in domestic skills rather than competitive and competent in occupational skills, and has otherwise exposed them to a host of societally defined gender-appropriate expectations. According to status attainment theory, this amounts to a set of experiences that differentiates women from men. For women, the results are traits and characteristics that have been identified as "feminine" as opposed to the counterpart term, "masculine." It seems reasonable to expect that women who have been exposed to experiences in their environment that

encourage them to become competent and comfortable in dispositional traits traditionally associated with masculinity, that it would follow that those women would have a more gender-integrated set of career aspirations and expectations than would other women who lack such exposure.

The result of environmental experiences in which women are taught and encouraged to develop abilities and dispositional traits such as assertiveness, competitiveness, self-esteem, confidence, and sense of competency, should cause a similar transitory expansion of aspirations and expectations that would encourage them to aspire to participate in a broader, more integrated work force with expanded opportunities for inclusion in a technologically growing society.

Hypotheses

Studies (AAUW, 1991; Betz, 1992; Betz & Hackett, 1986; Terlau, 1991; Whiston, 1993) suggest that career self-efficacy is positively influenced by exposure to activities and courses that tend to support dispositional traits that are typically associated with male socialization. Such traits include competitiveness, assertiveness, and goal orientation. Women who are exposed to experiences in sex-role socialization that tend to develop dispositional traits more commonly associated with the sex-role socialization of men will be more integrated in their occupational aspirations and expectations. This premise might be demonstrated by assessing the career expectations of high school women who participate in organized athletics and successfully complete courses in advanced mathematics and science classes and comparing them to the degree to

which such career choices may or may not be integrated by gender.

A locally prepared survey questionnaire was used to measure these parameters. These traits and characteristics were compared to the career aspirations and expectations of high school women across various levels of participation in any or all of the described activities including no participation whatsoever.

The major hypotheses of this study were:

Ho₁: Mean standard composite scores derived from the summation of all individual school-related course and activity scores will be the same for all women regardless of whether their career expectations are traditional, integrated, or nontraditional for their gender.

Ho₂: Mean standard scores for all mathematics course achievement will be the same for all women regardless of whether their career expectations are traditional, integrated, or nontraditional for their gender.

Ho₃: Mean standard scores for science course achievement will be the same for all women regardless of whether their career expectations are traditional, integrated, or nontraditional for their gender.

Ho₄: Mean standard scores for athletic achievement will be the same for all women regardless of whether their career expectations are traditional, integrated, or nontraditional for their gender.

Ho₅: Mean scores on all scales of the MSCS will be the same for all women regardless of whether their career expectations are traditional, integrated, or nontraditional.

Subtending Hypotheses

Subtending the major hypotheses were a number of contentions expected to develop as manifestations of the properties of the instruments. These internal (or subtending) hypotheses were expected to be linked with or intervene with the school-related environmental experiences and the occupational choice expectations. One element of interest was the participant's assessment of self as an entity with certain capacities or qualities over the variety of activities and experiences. Other elements that emerged, such as parental occupation and birth order, have been statistically processed in order to round out the description and profile of the participants. Besides the locally prepared questionnaire, the Multidimensional Self Concept Scale (MSCS, Bracken, 1992) was administered in an attempt to capture six subdimensions and a global level of self concept.

These contentions are stated in the following section as secondary or subtending hypotheses:

ho_1 : There will be no correlation between the mean standard scores for the global and the six subdomains of self concept and the mean standard scores for mathematics and science course achievement, athletic participation, or the composite score of all three.

ho_2 : There will be no difference in the career expectations of women whose parent(s) have professional occupations and women whose parents are employed in other occupations.

ho_3 : There will be no difference in the career expectations of

women whose birth order rank is first in their family of origin and women who rank elsewhere in birth order.

Instruments

Participants were asked to complete an experiential survey questionnaire and a self concept scale assessment inventory. The questionnaire sought to discover the subjects' involvement and level of participation in organized athletics, mathematics, and science course work in addition to occupational aspirations and expectations. The Multidimensional Self Concept Scale (MSCS, Bracken, 1992) assesses an individual's perception of self along a multidimensional hierarchy including six foundational subdomains and one overall, global measure of one's general sense of self.

Questionnaire

The questionnaire screens the participants for demographic data, including grade level, racial and ethnic background, birth order, parental occupations and education levels, and for school-related experiences pertaining to courses taken and attained level of achievement. In addition, it also solicits level and nature of participation in organized athletics either in regular high school programming or community recreation during Grades 9 through 12. Finally, the survey asks the student to divulge some of her future plans in regard to career and work.

Scores for participation in mathematics and science were calculated using a method similar to that for calculating academic honor points. That is, grades were quantified on a 4-point scale and multiplied

by the credit hours completed. Any mathematics or science class taken was awarded a credit for each semester completed that was, in turn, multiplied by a numerical factor equivalent to the grade received. For example, a student who completed an academic year in trigonometry with semester grades of A- and B would be scored as follows: $(1 \times 3.5) + (1 \times 3) = 6.5$ cumulatively for the year. This score would be added to any other scores related to achievement in advanced mathematics to formulate the total score in that category. The same procedure was used to calculate the science scores. The athletic activity scores were determined by awarding 2 points for sports participated in each year at the varsity level and 1 point for sports participated in at the junior varsity level or in civic recreation activity in any given year. The total athletic score was simply the sum of all points awarded between Grades 9 through 12, inclusive. All the scores from the questionnaire were first converted to \bar{Z} scores and then converted to standard scores with a mean of 100 and a standard deviation of 15.

The Multidimensional Self Concept Scale

The Multidimensional Self Concept Scale (MSCS, Bracken, 1992) assesses global self concept and six subdomains identified as those most foundational and important to adolescents. These subdomains are identified as social, competence, affect, academic, family, and physical. The MSCS is a context-dependent, multidimensional self concept model (Bracken et al., 1992). The instrument produces a profile of scale scores and percentile rankings for each of the subdomains, is administered in about 20 minutes, and is hand scored. The MSCS manual

reports .98 total scale internal consistency and .90 stability. MSCS subscale internal consistency ranges from .87 to .97, and stability coefficients range from .73 to .81 (Bracken, 1992). The MSCS consists of 150 Likert-type items and was administered to the study group at the same time as was the questionnaire.

Subdomains of Self Concept Measured by the MSCS

The following definitions of the specific subdomains of self concept measured by the MSCS are included for clarification and common understanding (Bracken, 1992):

Social--the ability to achieve one's goals and objectives through successful social interactions.

Competence--the ability to act upon the environment in order to solve problems, attain goals, bring about desired outcomes, and function effectively within the environment.

Affect--the ability to recognize, evaluate, monitor, describe, and discuss their behavior as a differential response to previous experiences; includes a perception of what one believes that others may believe about one's self.

Academic--the self-evaluation of achievement, functioning, and experiences in academic context and other school-related situations.

Family--the individual's view of those upon whom he or she is dependent for care, nurturance, and security. Family is a generic term that may include the natural or traditional family, a stepfamily, foster family, extended family, surrogate family, and any familial living arrangement.

Physical--one's concept of their body; their attractiveness, physical prowess or condition, dress, height, weight, health, and any other physical attributes to which the individual, as well as any others, may respond. (p. 4)

Data Collection Procedures

Students who agreed to participate and were granted permission to do so, were asked to complete the survey that described some of their environment, their type and level of participation in the various activities, courses relating to the research questions, and that outlined their career aspirations and expectations. No names were collected on either the questionnaire or the assessment instrument. Both instruments were stapled together, completed at the same time, and turned in as a set.

Using the data from this survey, the women were sorted into three groups based on various categories of career expectations defined as traditional, integrated, or nontraditional. Subjects for study were volunteers selected from among the participants who met the criteria by properly completing the questionnaire and the assessment instrument.

Data Presentation and Statistical Analysis

After the data were collected and assembled, it was organized so that sets could be entered in multivariate format with specific datum being identified as follows:

1. Mean composite score for all courses and activities.
2. Mean score for achievement in mathematics.
3. Mean score for achievement in science.
4. Mean score for participation in athletics.
5. Mean self concept scale score for the subdomain, social.
6. Mean self concept scale score for the subdomain, competence.

7. Mean self concept scale score for the subdomain, affect.
8. Mean self concept scale score for the subdomain, academic.
9. Mean self concept scale score for the subdomain, family.
10. Mean self concept scale score for the subdomain, physical.
11. Mean total (global) self concept scale score.
12. Index of occupational expectation; traditional (T = 1, integrated (I = 2), or nontraditional (N = 3).
13. Dichotomous index for parents' occupations; professional (1) or nonprofessional (2).
14. Dichotomous index of birth order; first (1) or not first (2).

Placement in any of the three occupational categories was determined from actual numbers of men and women in any given occupation provided by the U.S. Department of Labor, Bureau of Labor Statistics (1994a).

Statistical processes completed included frequency distributions of participants by occupational category as determined by stated job expectations, parents' occupational level (stated dichotomously as professional or nonprofessional), and birth order. Measures of central tendencies were calculated based on the converted standard scores of mathematics, science, and athletic participation, as well as the six domains and global scores taken from the MSCS. One-way analysis of variance (ANOVA) was performed for the occupational categories of traditional, nontraditional, and integrated and all the standard scores collected from the questionnaire and the MSCS. Each individual ANOVA included a multiple range test to graphically demonstrate how and which groups differed from the others. Parents' occupational level and participant's birth order

were each compared to the various standard scores using a t test for independent samples, and finally, correlation coefficients were calculated between all the standard scores collected.

Summary

This study addressed a number of research questions. What relationships exist between various school-related activities and courses and the degree of integration of career aspirations and expectations? How does one's perception of self, over a variety of domains, vary with the activity level and the choice of one's career? Are any of these variables significant and what, if any, are the common threads that make them so? How significant to the major hypotheses are the occupational levels of the parents? What part does birth order rank play in the selection of career choices? Collectively, all these scores and factors were addressed so as to discover what, if any, relationships exist relative to the major hypotheses and questions investigated.

CHAPTER IV

RESULTS

Introduction

As is often the case in educational or social science research, some questions cannot be answered through direct manipulation of the variables. Such is the case in this ex post facto investigation of career expectations of high school women. The variables being examined are attribute variables, that is to say, they are manifested by characteristics already held by the subjects under study. Unlike experimental research in which the variables are manipulated in an attempt to discover certain relationships, with ex post facto, the research is conducted after the variations in the independent variables have been determined by the natural course of events (Ary, Jacobs, & Razavieh, 1985). "In both types of research, interest is focused upon discovery of relationships in one's data" (Ary et al., 1985, p. 298).

In the present study, the major hypotheses posit three independent variables acting upon one main dependent variable and several other linking or intervening variables. The independent variables are (a) participation in advanced mathematics courses, (b) participation in advanced science courses, and (c) participation in organized athletic programs. The dependent variable is the category of occupational integration of the career expectations (traditional, integrated, or nontraditional). For simplicity and practical purposes, this hypothesis is operationalized by

comparing the mean activity scores for mathematics, science, and athletics participation among women who had, by grouping, indicated that they would choose either traditional, integrated, or nontraditional occupations. There were three secondary or intervening variables examined for effect on the hypothetical tests. These were parents' occupational level (professional or nonprofessional), birth order rank, and self concept both globally, and in six subdomains, as measured by the Multidimensional Self Concept Scale (MSCS, Bracken, 1992). These secondary variables, also characterized as intervening or contaminating variables, are environmental in nature in that they are reflective of the experiences and beliefs of the participants and thus become attributes in and of themselves. The key piece of this study, however, is the survey used to identify the courses and activities in which the participants engaged relative to mathematics, science, and athletics, and what occupational expectations they reported.

The balance of this chapter describes the population under study in detail and then specifically identifies the research questions to be addressed. Each major and subtending hypothesis is examined, in turn, and the statistical processes used and the findings are discussed in sufficient detail to permit logical and reasonable conclusions. As a foundation, essential data having to do with description of the population and measures of central tendencies are presented in order to simplify the understanding of, and undergird the conclusions drawn from the balance of the statistical processes.

The Study Population

Of the 73 students included in this study, 49 (67.1%) were in the 11th grade and 24 (32.9%) were in the 12th grade. Of the 11th grade students, 41 (83.7%) had completed some course work in advanced mathematics and 34 (71.1%) had taken one or more classes in advanced science. In both cases, the courses were above and beyond that required for the general education curriculum. Thirty-eight (79.0%) 11th graders participated in some form of athletics at some point in their high school career. The eight 11th grade women who did not take any advanced mathematics classes were all among the 15 students who did not take any advanced science, and three of those eight did not participate in any athletics.

Out of the 12th grade students surveyed, 15 (65.8%) had taken courses in advanced mathematics and 13 (54.2%) had taken classes in advanced science. Seventeen (70.8%) of the 12th grade women had participated in athletics during their high school careers. As with the eight 11th graders, none of the 12th graders who did not take advanced mathematics attempted to take any advanced science classes.

Twelve (24.5%) of the 11th grade women and five (21.8%) of the 12th grade women came from families in which one or both of the parents held professional level occupations. Twenty-two (44.9%) of the 11th graders and 10 (41.7%) of the 12th graders were first-born children. The average number of children in the family was 2.53 for 11th grade women and 2.42 for 12th grade women.

A number of questions were posed in order to gain some

additional insight into the general feelings of the participants about certain life issues and to describe the population in more depth. All 49 of the 11th grade women indicated that they would marry and all but three (6%) indicated that they planned to have children. The number of children that the 11th graders said they would have ranged from one to six, with the average being slightly over two (2.16).

Forty-three (88%) of the 11th graders planned to complete at least 4 years of college and 19 (39%) of them planned to attend graduate school. All the 11th grade women planned to have careers lasting from 15 to 50 years, with the average amounting to 36.05 years for the group. Forty-four (89.8%) planned to work long enough to be eligible for a pension.

One of the more controversial questions--"If . . . your husband receives a job offer at a substantial increase in pay, but it requires you to move and give up your job that you like very much, what would you do?"--evoked a variety of responses. Of the 11th graders, 28 (57%) of them said that they would give up their jobs for the benefit of their husband's career if necessary. Nine (18%) said they definitely would not and 11 (22%) were either unsure or did not respond to the item. Nine (38%) 12th graders said that, if necessary, they would give up their jobs for the sake of their husband's career opportunity.

Among the 12th graders, 22 (92%) said they would marry and 18 (75%) indicated that they would have anywhere from one to three children with an average of 1.52. Eighteen (75%) of the 12th grade women planned to finish college, with 11 (46%) of them planning to continue on into graduate school. The 12th graders expected to work

anywhere from 20 to 45 years, with the average being slightly less than that for the 11th graders who expected to work 33.89 years. Twenty-one out of the 24 (87.5%) 12th graders planned to work until eligible for a pension.

Research Questions

The questions raised and examined in this study are simply these:

1. Does the fact that an adolescent woman completes certain course work in mathematics or science increase the likelihood that she will consider a wider range of occupational choices rather than limit herself to those jobs primarily and traditionally held by women?
2. Are there elements inherent in organized athletic programs that, by her participation, a woman high school student will consider a wider range of occupations than those primarily and traditionally held by women?
3. Do the parents' levels of occupation have any influence in career choice selection?
4. Is birth order a factor in a person's selection of traditional, integrated, or nontraditional careers?
5. What, if any, influence does one's perception of self have on selection of traditional, integrated, or nontraditional occupations?

Summarily, this study looks at some aspects or factors associated with the school experience and the family of origin, and how they impact or influence an adolescent woman's expectation to be employed in a traditional, integrated, or nontraditional career?

Results

The activity scores for mathematics, science, athletics, and a composite of all three were tabulated and the participants were sorted into groups according to occupational expectations as being either traditional, integrated, or nontraditional for women. Table 1 presents the means and standard deviations for activity levels in mathematics, science, athletics, and in the composite for each of the three groups.

To determine whether activity levels in mathematics, science, athletics, and in the composite of the three differed with respect to traditionality or integration of occupational choice, one-way analysis of variances (ANOVA) were conducted. Criterion for rejecting the null hypotheses was set a $p < .05$. Activity levels in athletics did not differ significantly ($F(2,70) = .763, p = .4699$) across the groups. On the other hand, significant differences were found between women who chose traditional careers and those who chose integrated or nontraditional careers in the activity levels of mathematics ($F(1,70) = 5.93, p < .05$), science ($F(1,70) = 5.43, p < .01$), and the composite score ($F(1,70) = 5.67, p < .01$). As there were no significant differences in the scores of any of the domains of self concept by occupational choice category, those statistics were not included in Table 1.

When the participants were sorted into the dichotomous groups based on parents' occupational level (i.e., professional or nonprofessional), there were significant differences in activity levels in all of the measured parameters of mathematics, science, athletics, the composite score of the three, and in the social domain of the self concept scale.

Table 1
Means and Standard Deviations of Activity Levels by Occupational Expectation Group

Occupational expectation	Mathematics		Science		Athletics		Composite	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Traditional	91.4	12.9	91.5	12.6	96.9	13.2	91.9	12.1
Integrated	103.0	12.9	103.4	14.4	100.5	14.2	103.7	13.8
Nontraditional	103.8	15.5	102.9	14.5	102.6	18.1	104.0	15.7

The women of whom one or both parents held professional level jobs scored higher in all the activity categories and in the composite, but scored lower only on the social scale of the self concept assessment.

Table 2 presents the findings of the t tests for independent samples of parents' occupations.

In reference to birth order rank in the family of origin, there were no significant differences in any of the parameters or scales measured. Chi-square analyses of both the level of parental occupation and of birth order were inconclusive.

As expected, mean scores in mathematics, science, athletics, and the composite summary of all three, were all positively correlated at the .01 level. What was not anticipated was the fact that, of all of the domains of self concept, only the academic domain correlated with any of the school-related activities. The academic domain correlated with mathematics, science, and the composite score, but not with the athletics score. Other measures of self concept seemed to be insignificant and unrelated to either the issues of achievement in academics and athletics or occupational choice category. At the same time, however, the means of all of the scores measured by the MSCS were consistent with the national norms found in the MSCS technical manual (Bracken, 1992).

Table 3 presents the correlation coefficients for mathematics, science, athletics, the composite score for all three, and the academic domain of the self concept scale.

Table 2

t Test for Independent Samples of Mathematics, Science, Athletics, Composite Activity, and Social Domain Scores of the MSCS by Parents' Occupational Level
(Nonprofessional, N = 57, Professional, N = 16)

Occupational level	<u>M</u>	<u>SD</u>	<u>t</u> value	<u>df</u>	2-tail prob.
Mathematics					
Nonprofessional parents	96.7	12.9	-3.51	71	.001
Professional parents	110.1	15.3			
Science					
Nonprofessional parents	95.5	12.0	-5.39	71	.000
Professional parents	114.6	14.2			
Athletics					
Nonprofessional parents	97.3	13.7	-3.04	71	.003
Professional parents	109.5	15.7			
Composite					
Nonprofessional parents	96.3	12.5	-5.01	71	.000
Professional parents	114.3	13.4			
Social domain					
Nonprofessional parents	108.1	15.7	2.00	71	.049
Professional parents	99.6	11.8			

In light of the findings presented, the major alternative hypotheses were accepted for mathematics and science course achievement and for the composite score for all activities. That is, overall, mathematics,

Table 3
Correlation Coefficients for Mathematics, Science, Athletics,
Composite Activity, and Academic Domain
Scores of the MSCS

	Mathematics	Science	Athletics	Composite	Academic
Mathematics	—	.759	.310	.899	.407
Science	.759	—	.353	.881	.355
Athletics	.310	.353	—	.614	n.a.
Composite	.899	.881	.614	—	.393
Academic	.407	.359	n.a.	.393	—

* $p < .01$.

science, and the composite of all activity scores do correlate ($p < .01$) and are related in that manner. The athletics score showed no significant correlation with the other scores by itself, and the null hypothesis was accepted.

Of the subtending or intervening hypotheses, only the academic domain of the self concept assessment correlated with any of the school-related activities. In that case, the academic domain correlated only with the academic activities (i.e., mathematics and science) and the composite of the activity scores. There were differences among the activity levels of women whose parents were professionals and those whose parents were not, but there were no significant differences based on birth order. The outcomes of the chi-square analysis did not reject the null of the hypotheses for either of these measurements. Since there were no significant differences in any of the domains of the self

concept assessment among the three categories of job choices, then the null of the hypothesis relating domain scores to percentage of job choices not traditionally or primarily held by women must be accepted.

Answers to the research questions seem relatively clear. It appears that, as for Question 1, successful completion of advanced course work in both mathematics and science is, in fact, associated with increased expectations of women to seek more integrated or even nontraditional occupations. Athletics, on the other hand, by itself, does not appear to play any significant part or have any real or tangible relationship to career choice selection. Parental occupation appears to be an intervening factor in the relationship between school activities and career choice, in that daughters of parents who hold professional level jobs score higher, as a group, in mathematics, science, and athletics than the daughters of parents holding nonprofessional jobs. From the data collected, birth order does not seem to have any impact on either school activity level or occupational choice. Finally, self concept scores, in general, seem to play no significant part in the career selection process except that women with high mathematics and science activity scores also tended to have higher scores in the academic self concept domain.

CHAPTER V

CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS

Introduction

The underlying assumption of this project is that adolescent women who successfully complete courses and participate in activities that specifically build skills, knowledge, and competencies which support occupational choices other than those traditionally held by women will make career choices that reflect a wider range of options. In the present study, the contention is that positive experiences in mathematics, science, and organized athletics will inherently facilitate the development of additional skills, knowledge, and competencies that provide students with the confidence and willingness to stretch themselves in more challenging ways. Specifically, as hypothesized in this case, such students will have career expectations that reflect a wider scope of options including occupations not traditionally held by women.

The major hypothetical premise underlying this entire project is the contention that certain academic and extracurricular activities will enhance the desire and ability among adolescent women to make important life or career decisions. It is also contended that these young women will perceive a wider perspective of career options than they might otherwise. It was hypothesized that adolescent women who participate in activities designed to teach, encourage, support, and embrace certain attributes and dispositional traits will, in turn,

synthesize such characteristics into their own lives and it will be reflected by choices they make in their career expectation decisions. Such traits might include assertiveness, competitiveness, sense of accomplishment, self-confidence, poise, and a sense of overall self-efficacy. Adopting these characteristics should increase one's overall willingness to challenge aspects of their environment and its occupational offerings.

In the present case, such decisions are represented by their choice of careers as reported in the questionnaire item, "expectations." The contention is that the more the young women in this study were involved in the stipulated activities, the more integrated their set of occupational choices would be in their consideration of career options when compared to women with less or no such experiences.

The present study posits three main independent variables acting upon one main dependent variable. The independent variables are participation in advanced courses in mathematics and science and participation in organized athletic programs. The dependent variable is the category of occupational career expectations based on degree of integration (i.e., traditional, integrated, or nontraditional).

It was in this context that the underlying assumption of this project was established. Adolescent women who successfully complete certain courses and participate in activities that specifically build skills and competencies requisite for expanded occupational opportunities will take advantage of the experience and have career expectations that reflect a wider range of options. The contention here is that any positive experiences in mathematics, science, and organized athletics will

inherently serve as a foundation for the self-confidence and willingness necessary to allow these young women to stretch themselves in more challenging ways. It was anticipated that the women who participated in the study would make career choices that reflected a wider scope of options including occupations not traditionally held by members of their sex.

Several other linking or intervening variables were also examined to determine what effect they might have on the interaction of the main independent and dependent variables. Those variables included self-estimates of self concept, level of parental occupation (professional or nonprofessional), and birth order. Self concept was expected to reflect the level and degree of achievement in athletics and in the academic areas studied. Level of parental occupation was expected to be reflected in occupational aspirations, activity participation, and self concept. Finally, it was expected that birth order would influence both school activity involvement and career aspirations.

The Research Questions

Summarily, the key research questions addressed in this study were:

1. What relationships exist between various school-related activities and courses and the degree of integration of career aspirations and expectations?
2. Will an adolescent woman who completes certain course work in mathematics or science be more likely to consider a wider, more integrated range of occupational choices rather than limit herself to the

traditional female occupations?

3. Are there inherent elements in organized athletic programs that might cause a female high school student to acquire traits that would support her consideration of a wider range of career choices?

4. How does one's perception of self, over a variety of domains, vary with the choice (or range of choices) of one's expected career?

5. How does one's perception of self compare with any of the other variables examined?

6. How significant to the major hypotheses is the occupational level of the parents?

7. What part does birth order rank play in the selection of career expectations?

Collectively, all these factors have been addressed in an attempt to discover what, if any, relationships exist relative to the major hypotheses couched in the research questions. Summarily, then, what are the factors associated with the school experience and their environment that impact or influence an adolescent female's decision to choose a traditional, integrated, or nontraditional career?

Limitations of This Study

Two types of limitations of this study are evident: limitations regarding the population to which this study can be generalized and limitations regarding the validity of results obtained with the survey questionnaire. These limitations are discussed below.

Generalization Limitations

The participants in this study were 73 females selected from a sample of one hundred and one 11th and 12th grade high school students. The participants were predominately Caucasian (95.9%) and came from a community that included working class, middle class, and upper middle class neighborhoods. The 101 volunteers came from an eligible population of approximately 230 available 11th and 12th grade females. Out of the volunteer group, 73 completed the questionnaire and the assessment form correctly and ultimately became the study group sample. Also, this study examined only the "expected choices" of occupations and not those to which these women might otherwise aspire.

Since the research sample was predominately European-American, generalization should be limited to populations of European-American women. Caution should be exercised when applying these results to other racial, cultural, or ethnic groups whose life experiences might lead them to occupational choices and career plans quite different from that of the study population.

Validity Limitations

The Multidimensional Self concept Scale (MSCS, Bracken, 1992) has been nationally normed with over 2,500 subjects from across the United States. Reliability has been established as being greater than .90 in both internal consistency and stability for all scales as well as the total test (Bracken, 1992). Validity of the MSCS was also well established

through factor analysis of concurrent validity comparing the instrument with five published self concept scales. The five scales were the Coopersmith Self-Esteem Inventory (Coopersmith, 1984), Piers-Harris Children's Self Concept Scale (Piers, 1984), Self-Esteem Index (Brown & Alexander, 1990), Tennessee Self-Concept Scale, Revised (Roid & Fitts, 1988), and the Self-Perception Profile for Children (Harter, 1985). Correlations between theoretically similar scales ranged from .71 to .85 and .83 for the total scale where applicable.

The prepared survey questionnaire, on the other hand, was not subjected to any such rigors of validity or reliability testing. It was simply an assortment of items intended to generate comparative information about the participants' recent school experiences and their present and future aspirations and expectations. Additionally, information regarding some environmental factors were also requested as pertinent information (e.g., parental occupation, birth order, and marriage and family plans). The content of the items were inspired and generated by the basic hypothetical questions posed in the study and were posed only to collect information deemed necessary to test the hypotheses. Additionally, all of the information gained was provided through self-report, and data such as grades attained in the academic classes, in particular, may be suspect.

Relevance of the Study

According to Saveri (1991), the most important human resource issues to consider both now and in the year 2000 will be a constant need for retraining to meet the increasing complexities of technology.

Saveri claimed that both men and women will experience increased roles and responsibilities within their families. It has become almost an imperative for both partners in a marriage to have paid employment in order to maintain a standard of living comparable to or at the norm. Certainly, either a man or a woman expecting to survive as a single person, whether living independently or as a head of a household, will have to have marketable skills, knowledge, or abilities in order to provide adequate income to enjoy a reasonable lifestyle. Both men and women will be expected to take on expanding roles for both child care and for elder care. However, over and above all else, women must prepare themselves to enter careers that will provide for all contingencies. In the reality of the world, women will find themselves faced with a growing need to be able to provide for themselves and others and, as such, will, by default, if for no other reason, need to consider more integrated or nontraditional occupations.

On the other side of the argument, however, in reviewing the labor market projections (U.S. Department of Labor, Bureau of Labor Statistics, 1993b) for the period 1992-2005, there will be an ongoing need for new entrants into the job market (U.S. Department of Labor, Bureau of Labor Statistics, 1994b). With families growing smaller, the U.S. economy may, in fact, experience a competition for employees in some fields as opposed to the usual, or historical, competition among workers for available jobs (U.S. Department of Labor, Bureau of Labor Statistics, 1994b). This argument does not negate the argument for increased or differential job preparation.

Occupational fields that are going to experience the greatest

growth both in percentage increase and in actual numbers of persons required to fill them are diverse and many of them are not based in technology as may be the popularly held belief. In fact, the economy, including consumer demand, technology, and business practices are in a state of flux (U.S. Department of Labor, Bureau of Labor Statistics, 1994b). In the midst of rapid growth of technology, there is also growth in spendable income and leisure time. In 1992, the U.S. economy was valued at \$5 trillion dollars, a number that is expected to reach \$6 to \$7.2 trillion by 2005, an increase of 22% or 26 million jobs above the 1992 level (Gradler & Schrammel, 1994). As a result of all this, the area leading in overall growth is service occupations with 2.3 million new jobs projected between 1992 and 2005 for the food and beverage preparation and service industry alone. The largest single increase, percentage wise, in any occupational field will be in the area of "in-home" housekeeping and health care aid at 136% or 645,000 jobs. Other low technology occupations experiencing rapid growth include retail sales clerks (877,000), cashiers (669,900), general office clerks (654,000), janitors and cleaners (600,000), secretaries (386,000), receptionists (305,000), and human services workers (256,000 [136%]). Once again, the preponderance of jobholders in these occupations are often women. Entry level jobs in these fields are low in technology requirements and are compensated with commensurate pay scales.

Opportunities linked with technology are also rising in a number of significant areas. Among those occupations traditionally and primarily held by women, registered nurses, a relatively high technology

occupation, will climb from 1,835,000 to 2,600,000 for a 42% increase. School teachers, at both elementary and secondary levels will increase by 1,113,000 positions (U.S. Department of Labor, Bureau of Labor Statistics, 1994b).

Other than the obvious exceptions such as school teachers, registered nurses, certain health and human services related aides and workers, and some food service related occupations, many of these jobs will require little or no special preparation beyond a high school education. That being the case, the average earnings in the majority of such occupations will more likely be toward minimum wage and quite often be less than that for occupations traditionally sought and held by men. Following Hoyt's (1989) predictions that the majority (67%) of all new jobs will have to be filled by women, immigrants, and minorities, most of the new positions being created are going to be in occupations low in technology and more closely aligned with those considered "traditional for" or held primarily by women at the low end of the pay scale.

Some other, more integrated, occupational areas are projecting average to above average growth rates, but the real numbers represented by those populations are relatively small. Such occupations include the semiskilled, skilled, highly skilled, technical, or professional level occupations. Executive, administrative, and managerial occupations will experience average to above average growth. Average growth is defined as anything between 14% and 26%, and above (faster than) average meaning anything between 27% and 40% growth.

Computer systems engineering, mathematical, and operations research occupations will experience anywhere from slightly below

average (8%) to much faster than average growth with computer scientists and analysts leading the group at 111%, or 737,000 jobs. Life and physical science jobs will grow at average to above average rates as will social scientists, urban planners and managers, and lawyers. Professional specialty occupations fall mainly in the average growth category. These occupations usually imply a college education and, quite often, graduate level study. In addition, and unlike those occupations described in the previous paragraph, these jobs will pay higher than average salaries and often are categorized as integrated or nontraditional for women. Most of the occupations that fall within any of the occupational areas described above and that are not held as being traditional for either gender are also likely to require postsecondary education or training and pay better than average earnings.

The implications of the preceding paragraphs are such that only those who prepare themselves, academically or vocationally, will be afforded full partnerships in the economy of the 21st century. A number of studies (Abramovitz, 1988; Beller & Han, 1984; Betz & Fitzgerald, 1987; Betz & Hackett, 1986; Coyle-Williams & Maddy-Bernstein, 1992; Eden, 1992) have clearly demonstrated that there are no valid or compelling reasons for denying or restricting any occupational interest or pursuit to anyone based on gender, let alone any ethnic, religious, racial, or cultural heritage. The primary discriminator is lack of technical or professional preparation. Preparation starts in the public schools and the foundations for serious career preparation begins with the classes and courses taken during the secondary school years.

Much is known about classroom management, learning styles, and

delivery methods; however, education continues to discriminate based on gender in systematic ways (Sadker & Sadker, 1994; Strober, 1984). By providing limited information about nontraditional options and directing women toward traditional classes, school systems, and society in general, tend to perpetuate what is already a serious shortcoming in the potential of the labor force (AAUW, 1991). Failure by any young person to take prerequisite classes such as mathematics and science limits career opportunities.

For women, limited access to on-the-job training and apprenticeships, lack of support services such as child care and adequate transportation, and isolation and sexual harassment in the classroom also pose formidable barriers to their selection of nontraditional careers (Sadker & Sadker, 1994; Strober, 1984). Limited knowledge about women in nontraditional occupations can also lead to negative stereotyping, causing high school women to dismiss that which they perceive as an option for males only (Green, 1993).

Teenagers enter the job market at about the same rate for both boys or girls. Generally speaking, other than in the fast food industry, males enter jobs that primarily employ men, and women enter jobs that primarily employ women. The net effect for women is that this tends to lead them to lower paying service jobs.

Major Findings

Academics

There was a clear and significant relationship shown between a student's participation in mathematics and science and her willingness to

pursue careers from a broader spectrum of occupational choices. Women who took classes in advanced mathematics and succeeded also tended to take classes in advanced science. As a group, these women tended to be less likely to choose female-traditional occupations. This finding is consistent with numerous other studies (Betz, 1992; Betz & Hackett, 1986; Hackett & Betz, 1981; Terlau, 1991; Whiston, 1993). These studies focused on self-efficacy and how that construct impacted life-choice decisions. The belief in one's ability to perform is paramount to the likelihood to attempt to perform.

Knowledge seems to be the fundamental element of self-efficacy. "Self-efficacy expectations are a belief about one's ability to perform successfully at a given task or behavior" (Whiston, 1993, p. 175). It also is a predictor of whether or not a behavior will be initiated and how long one might persist in the face of adversity. This appears to be the fundamental argument of Hackett and Betz (1981) when they posited that women may lack strong expectations of personal self-efficacy in career related behaviors. This theory seems crucial to understanding the underrepresentation of women in many male-dominated career fields and women's underutilization of certain abilities and talents related to their career pursuits (Whiston, 1993).

The young women who studied and learned mathematics at an advanced level also tended to pursue science at an advanced level. The young women who had the most integrated or nontraditional set of occupational choices also happened to be the young women with the highest level of activity in mathematics and science. Students who did not pursue advanced mathematics and did not attempt any advanced

science courses tended to expect traditional occupations. In fact, there was an 11 to 12 point spread between the mean standard scores of both mathematics and science achievement of girls who chose traditional occupations and those who chose integrated or nontraditional occupations.

Women who came from families that included a professionally employed parent were more likely to take both mathematics and science and, as a group, expect to be employed in a more integrated group of occupational options. This may suggest that there is a higher set of parental-imposed or self-imposed goals and aspirations in such families, or it may stem from beliefs built into the family culture in which fewer artificial limits or sanctions are suggested or imposed. The notion that daughters of professional parents compare themselves to a different standard also seems to be supported by the fact that these women, as a group, scored lower in the social domain of self concept than did daughters of nonprofessional parents. One possible conclusion certainly must entertain the thought that although these young women, who collectively achieved mean scores that were consistent with the national norms for the instrument, still set different goals. That differentiation might be based somewhat on standards established in the family of origin.

Athletics

The majority of the women surveyed (85%) participated in some form of athletics at some time in their high school career. However, athletics do not seem to play a significant part in influencing women one way or another in their choice of careers. Here again, women from

homes with a professional parent(s) were more involved in organized athletics even while pursuing a more rigorous academic schedule. Yet, when measured according to the three occupational categories (traditional, integrated, and nontraditional), there were no significant differences between the mean scores for participation. Athletics seems to be important to young high school women; however, it simply does not differentiate according to occupational expectations. Again, linking knowledge and self concept to imply self-efficacy in certain behaviors was not a focus of the study; but it appears that such a construct, in this case, does not auger into career expectations.

Self Concept

The notion of self concept as a factor of career choice selection was not supported in the findings of this study and it appears to be of limited value by itself. Self concept may be a more narrow descriptive expression of knowledge about one's self, or what one believes to be representative of his or her general behavior in a particular domain and may be viewed as predictive of future behaviors in similar circumstances (Bracken, 1992). It is what one believes to be the truth about themselves in a descriptive manner.

On the other hand, self-efficacy as defined by Hackett and Betz (1981) and Whiston (1993) is a compound construct involving knowledge, talents, abilities, and a self concept descriptive of one's beliefs about their capability to perform, comprehend, or understand them. It is a construct that represents what people see in themselves as viable in terms of doing, being, or comprehending.

In the present study, the participants, as a group, were found to be "normal" in terms of self concept. That is to say, the mean scores of the study population did not differ significantly from those found in the normative tables drawn from across the country by Bracken (1992). Only the academic domain of self concept correlated with any of the other parameters. The academic domain of self concept was positively correlated to both the mathematics and the science scores as well as the composite score. The only other aspect of self concept that appears to be significant is the fact that women whose parent(s) held professional level occupations scored slightly lower on the social domain than the rest of the study group. While interesting, in and of itself, this fact cannot be linked directly to career expectation.

In contrast with the findings of the widely published report by the American Association of University Women (1991), there was no apparent drop in how the young women in this study viewed themselves. Upon reviewing the norm tables in the administrator's manual of the Multidimensional Self Concept Scale (MSCS, Bracken, 1992), (N = 2,501 school children in Grades 5 through 12), there was no significant difference in self concept by gender for any age grouping from 9 to 19 years. One minor conclusion drawn here is that the findings of this study seem to be consistent with Bracken's work, there being no significant departures from the national norms.

Discussion

Implications for Counselors

Stewart (1989) claimed that women enter nontraditional jobs for several reasons. Integrated and nontraditional careers offer women opportunities that are unlike those found in traditional jobs. According to Stewart, opportunities to do something different, to be creative, to achieve greater independence and autonomy through higher incomes are the reasons most often cited by women who have chosen nontraditional careers. Women seem to find job satisfaction in nontraditional occupations by achieving feelings of accomplishment that are not available to them through traditional occupations (Green, 1993; Stewart, 1989). Once in these occupations, women encounter not only the usual positive and negative aspects of that job, but they also collect experiences that are unique to their nontraditional status (Green, 1993).

The linkage between mathematics, science, and career expectation is established within the study population. Certainly, there is enough evidence to suggest that females, throughout their public school experience, are as likely to be as successful as males in any mathematics or science class (Coyle-Williams & Maddy-Bernstein, 1992; Fennema & Sherman, 1977; Hofferth, 1980). If there is a barrier to such success, it is more environmental than anything else (Kaplan & Aronson, 1994; Sadker & Sadker, 1994). Counselors can help young women to overcome barriers of an environmental nature that may attack or oppose their notions of self-efficacy. Counselors can direct or encourage women students to attempt course work that provides more academic

challenge. They can assist in helping students to overcome feelings of risking the loss of feminine identity (Butler, 1969). There are issues having to do with the presence or lack of personal support systems that each woman has to evaluate in relation to her career choice (Cunanan & Maddy-Bernstein, 1993). If there is a linkage between parental occupation and achievement and career selection, it seems reasonable to suggest that this would be an area where the sensitive counselor can assist young women in setting their sights towards challenges more appropriately suited to their abilities. Career decisions impact "significant other" relationships, and they affect the individual's entire family structure (Stewart, 1989). This is another area where counselors can be extremely effective in assisting students who are experiencing difficulties.

Armed with this information, counselors may want to consider carefully the opportunities available for impacting young women of this age group in positive, helpful ways. It seems reasonable to expect that counselors might want to champion the cause of gender equity by helping to create a more inviting and supportive environment in the mathematics and science classrooms for these students. By describing and defining their roles so as to help assure equal access to all opportunities for all students, counselors can promote and support the efficient and equitable use of the true labor market resources.

Implications for Teachers

Teachers can plan and design curriculum and delivery methods to support high school women in developing expectations and the requisite

skills necessary for entry into a wider array of career options. Teachers need to be more sensitive to the needs of girls in the classroom (Sadker & Sadker, 1994). Teachers can be vigilant to address all children with equal amounts of attention and allow all children equal and successful access to full involvement and participation in all aspects of the classroom delivery.

The Carl Perkins Act of 1990 is very clear in its mandate to schools to create an environment that is both attractive to and assures the success of women students in a variety of academic and vocational offerings. Such efforts must be designed to raise the awareness of integrated or nontraditional occupations for women (Coyle-Williams & Maddy-Bernstein, 1992). Gender equity is, in fact, specifically addressed in the Carl Perkins Act of 1990 and is a budget line item in the foundation grant application for vocational funds supplied to local school districts.

Teachers can assist by identifying role models from the community who can demonstrate the reality of success for women in a variety of occupations at both professional and blue-collar levels. Using recent texts and other available materials (Bergman, 1986; Coyle-Williams & Maddy-Bernstein, 1992; Cunanan & Maddy-Bernstein, 1993; Ehrhart & Sandler, 1987; Green, 1993; Jamieson & O'Mara, 1991; Kaplan & Aronson, 1994; McGarraugh, 1990), teachers can gain helpful insight into how and why women are often left out of the mainstream when it comes to career development. Teachers can also find useful strategies and model programs for implementation of plans to rectify disparities and

inequities in teaching delivery styles and the attention provided to females.

Implications for Schools

Schools can use the information gleaned from this study to initiate and support programs that will promote gender equity in careers. That mathematics and science are key factors in the promotion of broader opportunities for women students has been demonstrated in this study and elsewhere (Kaplan & Aronson, 1994). It is also reasonable to expect that by examining the school curriculum and environment, much can be accomplished towards making women students feel valued and accepted in other challenging programs or career tracks not traditionally pursued by women (Munson, 1992). The fact that women from homes where one or both parents are professionally employed involve themselves more in all of the school activities studied is established. Schools can seek ways to discover and replicate the same or similar attitudinal structures that arise from such families. Nash (1991) has published an excellent curriculum guide for changing the school environment to one that is more equitable to all students. Nevill and Schlecker (1988) offered considerable insight into the relationship of self-efficacy and assertiveness to the process of women's career selection. Schools can use such insights in the preparation of both the curriculum and environment so as to serve all students better. Other works (Pricken, 1989; Rea-Poteet & Martin, 1991; Schwartz & Zimmerman, 1992) suggest numerous ways to develop programs and develop better understanding of the needs of women in the career development process.

Recommendations for Further Studies

There clearly is a call for more studies in many aspects of career counseling and, in particular, career counseling for women. There is no question that the findings of this study leave many other questions unanswered. What is there about mathematics and science that lead women to select careers beyond that which is traditional for their gender? What motivates some women students to select mathematics and science classes while others seem to reject these choices out of hand? Do females choose or reject for the same reasons as males? Are the reasons for selection or rejection of mathematics and science founded in the same thought processes as for career selection? What is different about the home environment of daughters of professionally employed parents and other young women? In light of published reports to the contrary, why is it that there is no significant differences in mean scale scores of self concept between genders, while there appears to be so much difference in self-efficacy beliefs? These questions remain and need further investigation. The current mandates both from state departments of education and from federally enacted legislation require school districts to become vigorously proactive in ensuring the full inclusion of all students in all opportunities presently available.

Conclusions

There is a relationship between mathematics and science achievement and career expectations. This study found no apparent relationship between athletic participation among high school girls and

career expectation. The environment in which children are raised certainly has an impact on both school achievement and, ultimately, career choice (Bandura, 1977; Betz & Hackett, 1986; Crowley, 1980; Eden, 1992; Fitzgerald & Betz, 1983; S. King, 1989; McBride, 1990; McGraw, 1991; McKenna & Ferrero, 1991). The fact that women from homes with professional parents have achieved more than other women probably is instinctively comfortable to the reader because it seems to fit a generalized impression that distinguishes the "haves" from the "have nots." It is a notion that needs further investigation.

Schools, teachers, and counselors need to be more proactive in supporting choices of students that do not fit some preconceived mold. Girls especially need to be encouraged to try new things, to stretch themselves in terms of learning. Positive role-modeling should be used and emphasized to demonstrate success by others who have gone before. If the labor market is going to expand at the rate projected and in the directions predicted, then, in order to enjoy economic security in the 21st century, all students need to avail themselves of, and be supported in preparatory education and training that will meet and expand their occupational expectations.

APPENDICES

Appendix A
Experiential Survey Form

Experiential Survey Form

Survey of eleventh and twelfth grade women in academic achievement and other school-related experiences.

PERSONAL DATA

GRADE IN SCHOOL _____ AGE IN YEARS and MONTHS _____

NUMBER OF CHILDREN IN YOUR FAMILY _____

BIRTH ORDER RANK (1st, 2nd, etc.) _____

MOTHER'S OCCUPATION _____

FATHER'S OCCUPATION _____

RACE: Please check one.

1. African-American ____ 2. American Indian ____
 3. Asian ____ 4. Caucasian ____ 5. Hispanic ____
 6. Other (Specify) _____

SUMMARY OF ACADEMIC ACHIEVEMENT IN MATH AND SCIENCE

Mathematics: List all mathematics courses you have completed (i.e., Algebra, I, II, III, or IV, Geometry, Trigonometry, Calculus, etc.) or are presently enrolled in. Indicate the grade you received (AS WELL AS YOU RECALL) in the space provided.

GRADE	COURSE	GRADE ACHIEVED	
9th	_____	Sem 1 _____	Sem 2 _____
10th	_____	Sem 1 _____	Sem 2 _____
11th	_____	Sem 1 _____	Sem 2 _____
12th	_____	Sem 1 _____	Sem 2 _____

Science: List all science courses that you have completed (i.e., Physical or General Science, Biology, Chemistry, Physics, etc.) or are presently enrolled in. Indicate the grade you received (AS WELL AS YOU RECALL) in the space provided.

9th	_____	Sem 1 _____	Sem 2 _____
10th	_____	Sem 1 _____	Sem 2 _____
11th	_____	Sem 1 _____	Sem 2 _____
12th	_____	Sem 1 _____	Sem 2 _____

SUMMARY OF ATHLETIC PARTICIPATION

If you have you participated in any organized athletic programs during your high school years, at varsity or junior varsity level, or any organized civic or community recreational athletics, please indicate by checking the sports listed below and filling in the appropriate blanks:

SPORT	YEARS	LEVEL		Civic	Rec
		JV	Vars		
Basketball	_____	_____	_____	_____	_____
Golf	_____	_____	_____	_____	_____
Softball	_____	_____	_____	_____	_____
Swimming	_____	_____	_____	_____	_____
Tennis	_____	_____	_____	_____	_____
Track and field	_____	_____	_____	_____	_____
Volleyball	_____	_____	_____	_____	_____
Other (Specify)	_____	_____	_____	_____	_____

POST-HIGH SCHOOL PLANS FOR EMPLOYMENT

Career Plans: If I could become anything I want as far as an occupation, my top 6 choices of jobs would be:

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

The career or occupation that I really expect to have or make my life's work is:

CAREER PREPARATION

To pursue the career of my choice, I will need to complete:

High School only _____
 On-the-job Training only _____
 Vocational/Technical Program _____
 College (4 year degree) _____
 Graduate School _____

How many years altogether do you think that you will be in school or in some other form of training in preparation for your career? _____

THE "FAR" DISTANT FUTURE

In the blank spaces provided, describe what you think your life will be like when you are 35 years old:

Do you think you will be working in paid employment?

If so, what kind of occupation will you be working in?

Do you think that you will have been married? _____

Do you think that you will have children? _____ If so, how many? _____

If you have a family, how will it affect your career plans?

If you are married and your husband receives a job offer at a substantial increase in pay, but it requires you to move and give up your job that you like very much, what will you do?

THE "GOLDEN YEARS"

How many years do you plan to work in full time paid employment altogether? _____

Do you plan to work at paid employment long enough to earn a retirement pension? _____

Appendix B
Informational Letter to Parents

College of Education
Counselor Education and Counseling Psychology



Kalamazoo, Michigan 49008-5195
616 387-5100

WESTERN MICHIGAN UNIVERSITY

Dear Parent:

This letter is to describe a research project to be conducted at Marshall High School and to invite your daughter's participation in it.

This study will compare the occupational aspirations and expectations of high school women who participate certain school-related activities and complete certain course work, with women who do not participate in such activities. It is an attempt to learn more about the relationships between gender-stereotyped behaviors and career choice decision making. What is discovered may prove valuable to teachers and counselors who, in turn, may be able to devise more effective methods by which to deliver academic and career development curriculum and assist all high school students in making more informed career choice decisions.

This study focuses primarily on the career development of high school women and your permission is being requested to allow your daughter's participation. The project will be completed in conjunction with regularly scheduled classes resulting in minimum interference with the learning process. In fact, your daughter may enjoy her involvement and could possibly gain some valuable insight about herself.


All students having parental permission will be asked to complete a survey form identifying their involvement and experiences in a variety of school-related activities as well as career and future plans. Participants will then be asked to complete a self-concept assessment called the Multidimensional Self-Concept Scale (MSCS).

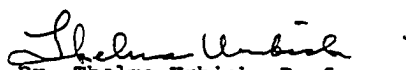
All data will be collected anonymously and students will not be identified by name in any reports of this research. Findings of the study will, however, be published in the form of oral and written reports. All documents related to this survey will be safeguarded in accordance with university guidelines; meaning, they will be maintained by the research associate until the project is completed at which time they will be destroyed..

If you decide to allow your daughter to participate, you will be completely free to withdraw consent at any time prior to the actual collection of data.

When the study is completed, the principal will be provided with a summary of the results which will be available to you upon request. Thank you very much for your consideration and cooperation in this important project.

Sincerely,


Elwood M. Bowers, MA, LPC
Research Associate
Western Michigan University


Dr. Thelma Urbick, Professor
Principal Investigator
Western Michigan University

Appendix C
Informed Consent Form

College of Education
Counselor Education and Counseling Psychology



Kalamazoo, Michigan 49008-5195
616 387-5100

WESTERN MICHIGAN UNIVERSITY

INFORMED CONSENT

Principal Investigator: Thelma M. Urbick, Ph.D.

Research Associate: Elwood M. Bowers, MA, LPC

I understand that my daughter has been invited to participate in a research project investigating the effects of various school-related experiences on the career choice decisions of adolescent women. This study will compare the occupational aspirations, and expectations of high school women who participate in certain school-related activities and complete certain course work, with women who do not participate in such activities or courses. I further understand that this project will fulfill Mr. Bowers' research requirement for the degree of Doctor of Education.

My consent for my daughter to participate in this project means that she will be administered a brief survey describing some of her high school experiences and her career and future life plans. Students will then be asked to complete a self-concept assessment entitled Multidimensional Self-Concept Scale (MCSC). Both the survey and the assessment instrument will be administered by Mr. Bowers during an assembly lasting less than one class period. Appropriate school personnel will be present at all times.

I understand that all data will be collected anonymously. This means that my daughter's name cannot be traced to any information nor will her name be used in any reports, oral or written, resulting from this study. All instruments used to collect data will be maintained by Mr. Bowers who promises to allow no unauthorized access to any completed instruments and that upon completion of the project, all instruments used will be destroyed.

I understand that the only risks anticipated are minor discomforts typically experienced by youngsters when they are being tested (e.g., boredom, mild stress due to the testing situation). I understand that all the usual methods employed during standardized testing to minimize discomfort will be employed in this study. I understand that, as in all research, there may be unforeseen risks to my youngster. Further, I understand that, if an accidental injury occurs, appropriate emergency measures will be taken, however, no compensation or treatment will be made available to me except as otherwise specified in this consent form.

I understand that, if my daughter refuses or quits, there will be no negative effect on her school programming.

I understand that I may also withdraw my daughter from this study at any time prior to the collection of data without any negative effect on school services provided to her. If I have any questions or concerns about this study, I may contact either, Mr. Bowers at 758-3862 (local) or Dr. Urbick at 1-372-2971 (Western Michigan University). I may also contact the Chair of Human Subjects Institutional Review Board or the Vice President for Research, Western Michigan University.

My signature below indicates that I give my permission for my daughter (name) _____ to participate in the study and to be administered the instruments indicated and for the data so collected to be used in the manner described.

signature Date _____ Parent

Appendix D
Informed Assent Form

College of Education
Counselor Education and Counseling Psychology



Kalamazoo, Michigan 49008-5195
616 387-5100

WESTERN MICHIGAN UNIVERSITY

INFORMED ASSENT

Principal Investigator: Thelma M. Urbick, Ph.D.

Research Associate: Elwood M. Bowers, MA, LPC

I understand that I have been invited to participate in a research project entitled "Career Aspirations and Expectations: The effects of variations in sex-role socialization experiences on the career choice decisions of adolescent women," a study to compare the occupational aspirations, and expectations of high school women who participate in organized athletics, complete course work in advanced science and/or mathematics with women who do not participate in such activities. I further understand that this project will fulfill Mr. Bowers' dissertation research requirement for the degree of Doctor of Education.

My agreement to participate in this project means that I will be administered a brief survey describing my high school experiences in athletics, mathematics, science, and my career aspirations and future plans. From these surveys, 100 participants will be randomly selected to complete a self-concept assessment entitled Multidimensional Self-Concept Scale (MCSC). Both the survey and the MCSC assessment will be administered by Mr. Bowers in an assembly format and in the presence of appropriate Lakeview High School personnel.

I understand that all data will be treated as anonymous. This means that my name cannot be traced to any survey or assessment information nor will my name be used in any reports, oral or written, resulting from this study. Participant lists and all instruments used to collect data for this project will be maintained by Mr. Bowers and kept in a locked file when filled in. Upon completion of the project, all instruments and participant lists will be destroyed.

I understand that the only risks anticipated are minor discomforts typically experienced by young people when they are being tested (e.g., boredom, mild stress due to the testing situation). I understand that all the usual methods employed during standardized testing to minimize discomfort will be employed in this study. I understand that, as in all research, there may be unforeseen risks. Further, I understand that, if an accidental injury occurs, appropriate emergency measures will be taken, however, no compensation or treatment will be made available to me except as otherwise specified in this consent form.

I understand that I may also withdraw from this study at any time without any negative effect on school services provided to me. If I have any questions or concerns about this study, I may contact either, Mr. Bowers at 758-3862 (local) or Dr. Urbick at 1-387-5123 (Western Michigan University). I may also contact the Chair of Human Subjects Institutional Review Board at 1-387-8293 or the Vice President for Research, Western Michigan University at 1-387-3698.

My signature below indicates that I agree to participate in the study described above and to be administered the specific instrument described and for the data so collected to be used in the manner described.

Name _____ Date _____

Appendix E
Approval Letter From Human Subjects
Institutional Review Board

Human Subjects Institutional Review Board

Kalamazoo, Michigan 49008-3899
616 387-8293

WESTERN MICHIGAN UNIVERSITY

Date: March 22, 1994

To: Elwood Bowers

From: M. Michele Burnette, Chair

Re: HSIRB Project Number 94-02-16

A handwritten signature in cursive script, reading "M. Michele Burnette".

This letter will serve as confirmation that your research project entitled "Career aspirations and expectations: Examining the effects of variations in sex-role socialization experiences on the career choice decisions of adolescent (high school) women" has been **approved** under the full category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

You must seek reapproval for any changes in this design. You must also seek reapproval if the project extends beyond the termination date.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: March 22, 1995

xc: Urbick, CECF

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