

INFLUENCES ON WOMEN'S EDUCATIONAL ASPIRATIONS

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by

Jean Stockard

Department of Sociology
University of Oregon
Eugene, Oregon 97403

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Influences on Women's Educational Aspirations

This paper examines the relative influence of the parental family, school, work, and adult family experiences on women's educational aspirations. Subsequent papers in the series will examine influences on occupational aspirations and on eventual educational and occupational attainment.

As noted below in the literature review, many studies have looked at influences on occupational and educational aspirations and attainments. A number of these studies have excluded women from their sample. Most of the studies have also looked at the total range of occupations and have not focused specifically on scientific careers. While women majors in the sciences and social sciences are not always uncommon at the undergraduate level, they are much less often found at the most highly trained levels.¹ To explore how these inequities develop the sample for this study is limited to women with undergraduate majors in the sciences and social sciences and examines influences on both the level of educational aspirations in terms of degrees aspired to and the sex-typed nature of the aspirations as measured by the proportion of males in the field chosen. The examination of the level of aspirations parallels work on status attainment while the examination of the sex-typing of the aspirations is more related to studies of sex roles. Since at least the mid 1970's women have been about as likely as men to

receive both bachelors' and masters' degrees, yet vast discrepancies in the incomes of equally well educated women and men remain, largely because men and women work in different areas. Thus not just the level of attained education but also the field of endeavor are important determinants of future achievements.²

In the pages that follow some of the previous work in this area is reviewed and a theoretical model that guides this analysis and that of the later papers in this series is presented. The methodology is explained and the results of the current analysis are presented and briefly discussed. A full discussion of the implications of the results is saved for later papers in the series.

2 Even when men and women work in the same area or perform equivalent jobs the sex discrepancies in pay usually remain. The present study is not designed to examine this process of sex discrimination in the occupational world but instead to examine influences on the aspirations and achievements of women. It is recognized, however, that such sex discrimination can affect eventual achievements and the later papers reporting influences on achievements will take that variable into account. Unfortunately, we cannot directly assess at this time the extent to which perceptions of or fear of sex discrimination affect women's aspirations in our sample.

1 While 41 percent of all bachelor degrees in mathematics and 20 percent of all the bachelor degrees in computer science in 1975-76 were given to women, only 11 percent of the Ph.D. degrees in mathematics and 9 percent of the Ph.D. degrees in computer science were given to women in those years. Similarly, 54 percent of the bachelor degrees in psychology, 57 percent of the bachelor degrees in anthropology, and 59 percent of all the bachelor degrees in sociology awarded in 1975-76 were given to women; but only 32 percent of the Ph.D. degrees in psychology, 37 percent of those in anthropology, and 30 percent of those in sociology were given to women. (National Center for Educational Statistics, 1978).

Previous Work in the Area

Studies of educational and occupational aspirations and achievement have been relatively common in the literature. These studies generally base their work on the premise that educational and occupational aspirations are mutually related, that aspirations causally influence actual achievements, and that educational attainment influences occupational attainment. Empirical evidence tends to support these assumptions (Alexander, *et al.*, 1975; McClendon, 1976; Sewell and Shah, 1967), although there is some evidence that the correlation between educational and occupational aspirations is lower for women than for men (Rosen and Aneshensel, 1978; Rey, *et al.*, 1976).

The early literature in this area tended to focus on vocational choice (e.g., Tyler and Sundberg, 1964; Tyler, *et al.*, 1968; Holland, 1959). Some theories noted the importance of early family experiences (e.g., Roe and Siegelman, 1964), and others looked at social psychological variables such as values, attitudes, and personality needs (Rosenberg, *et al.*, 1957). While most theories of vocational choice did not differentiate between males and females, George Psathas (1968) specifically dealt with the question of women's career or occupational aspirations and suggested that it was important to consider the impact of women's plans for marriage and parenthood, the models provided by their parents, and their attitudes toward women's roles. While providing some good theoretical insights, the studies based on vocational choice literature were often not overly sophisticated methodologically and did not commonly use multivariate analysis techniques.

In recent years researchers have generally turned to the status attainment literature and have tried to apply the models used fairly successfully to explain the aspirations and attainments of young men (e.g., Blau and Duncan, 1967; Sewell, *et al.*, 1970; Spaeth, 1970; Hauser, 1972; Duncan, *et al.*, 1972) to explain the educational and occupational aspirations and attainments of women. These models

take into account the social status background of the subjects as well as the influence of the expectations of significant others. Studies using this approach are generally fairly sophisticated methodologically.

While it is probably not sufficient to suggest that only the variables included in the status attainment models affect women's aspirations and achievements, it is probably necessary to include these variables in an analysis. As suggested by Psathas (1968), variables specifically related to the situation of women, including their marriage and family plans, their sex role related attitudes, and their dedication to a career are also important. Below we briefly review the results of previous work, looking at studies of how women's parental family, experiences in school, experiences in the work world, and expectations of and experiences in their adult family influence their aspirations and later achievement. We then present preliminary conceptual models that are based on this literature and serve as the basis for the proposed research.

The Influence of the Parental Family--The status attainment literature clearly shows that both boys and girls from higher status families are more likely to aspire to higher levels of education and generally to higher status occupations. In fact, for middle or upper middle class women, the decision not to go to college is the unique decision (Douvan and Kaye, 1962). Also, while girls generally aspire to female typed occupations, girls from higher status families aspire to more highly differentiated occupations than girls from lower status homes aspire to (Werts, 1967; Gybers, *et al.*, 1968).

In comparison to boys, social status appears to be a stronger influence on girls' educational aspirations (Rosen and Aneshensel, 1978; Alexander and Eckland, 1975; Sewell and Shah, 1967; Treiman and Terrell, 1975) and a weaker influence on their occupational aspirations (Marini and Greenberger, 1978; Werts, 1966, 1967; Hauser, 1971; Otto, *et al.*, 1974; Haut and Morgan, 1975; Sewell, *et al.*, 1957).

This is generally interpreted as resulting from the tendency for families to invest in the education of boys when a choice must be made, thus reserving girls' best educational opportunities to those from families with the financial means to provide their education easily. The second result probably occurs because of the weaker connection between educational and occupational aspirations for girls than for boys (e.g., Rosen and Aneschensel, 1978). Many girls with educational aspirations as high as those of boys aspire to jobs with much less prestige.

While the status attainment studies focus on the level of education and the prestige of the occupation desired or attained, other studies have examined directly the impact of social status on the career commitment of young women (often called work orientation). While some studies find no relation between parental social status and a young woman's work orientation (Seigal and Curtis, 1963; Zissis, 1964; Stockard, 1974), others have found that college women from lower status backgrounds are more often devoted to a continuous and thus less traditional work orientation (Anderson, 1967; Eyde, 1958).

The social status of parents may help define attainable goals for young people, especially in terms of what level of education and occupation may be attained (cf., Scanzoni, 1967). Yet, other aspects of the parental family may influence the motivations necessary for commitment to a career, especially in the case of women pursuing non-traditional areas. For instance, parental encouragement, warmth, and moral support appear to be important in promoting non-traditional choices and views (Lipman-Blumen, 1972; Steinmann, 1959; Ginzberg, 1966; Sandis, 1970; Feingold, 1972; Tangri, 1972).

Status attainment literature often reports that the expectations of the parent of the same sex (thus for daughters, the encouragement of the mother) are more important than those of the other-sex parent in influencing a young person's educational and occupational aspirations (e.g., Rosen and Aneschensel, 1978). Besides

actively encouraging her daughter, the mother may also serve as a model for her daughter. In fact, many studies have noted the influence of a working mother on a daughter's decision to pursue a non-traditional career and to show greater career commitment (Almquist and Angrist, 1970; Eyde, 1968; Fogarty, *et al.*, 1970; Zissis, 1964). In some cases it appears that it is not simply whether or not the mother works, but the attitude the mother holds toward her employment (Douvan, 1966; Lipman-Blumen, 1972; Stockard, 1974), the prestige of her occupation (Almquist and Angrist, 1970), or the nature of the occupation (Tangri, 1973), that has an important influence on her wanting or approving of non-traditional careers for women.

A young woman's career plans are also influenced by her father, his encouragement and his attitudes toward non-traditional roles for women. In fact, from an extensive study of women in junior high, high school, and young adulthood, Matthews and Teideman (1964:382) concluded that "a woman's perception of the male attitude toward her use of her intelligence" is the most important influence on her choice of life styles. Similarly, in her studies of the motive to avoid success, Matina Horner (1972) has suggested that the attitude of male peers toward women's roles is a significant factor in influencing women's motives for success (see also Hawley, 1968; Tangri, 1972). A large body of literature concerned more with the development of "psychological femininity" than with career commitment or career choice also notes the impact of the father on the development of femininity (see Johnson, 1963, 1975), and studies of women who have pursued scientific careers or who appear especially creative in their college work note that the subjects identify more with their fathers than women in more traditional areas or with less creative orientations (Lovett, 1968; Helson, 1967).

Finally, it should be noted that some studies have commented on the predominance of first born children (Altus, 1965; Sutton-Smith and Rosenberg, 1970; but see Datta, 1968 for an excellent critique) and of women without brothers (Helson,

1971) in successful and creative populations. This research tends to indicate that first born children are more achievement oriented (e.g., LeMay, 1968), although other studies do report that first born women are more traditionally oriented toward the feminine role than later born women (Kammeyer, 1966; Hendershot, 1969).

School Experiences--Academic success and its recognition appear to be important influences on the pursuit of advanced education and non-traditional careers. The status attainment literature notes an important influence of academic ability on both occupational and educational expectations and attainments but, as with the impact of social status, academic ability may influence boys' occupational aspirations or expectations more than girls' (Sewell, *et al.*, 1957; Haut and Morgan, 1975; Hauser, 1971; Sewell and Shah, 1967). Several studies of college women note that grades are an important predictor of graduate school plans, perhaps even more important than other variables (Wilson, 1967; Davis, 1964). Doing well in school also appears to be related to career commitment, especially if the student has done well in mathematics or science related areas (Astin, 1968; Rezler, 1967; Tyler, 1964; Watley, 1969).

Not just grades, but being recognized for academic achievement through participating in research or honors programs or getting other social recognition may influence plans for graduate study (Thistlewaite and Wheller, 1966; Anderson, 1967). The expectations and encouragement of teachers are important influences on plans for advanced education (Thistlewaite and Wheller, 1966) and, in fact, may account for most of the effect of academic achievement itself (Williams, 1972). Greater contact with counselors, at least during the high school years, may also be important (Astin, 1968); and the impact of counselors and teachers as models for young women cannot be discounted (Douvan, 1979).

Finally, apart from academic success and recognition, attending higher quality

colleges can influence a woman's choice of atypical careers (Bielby and Bielby, 1976) and, although the evidence is somewhat contradictory, coming from a high school in a larger community may influence having higher expectations both for attending college (Berdie and Hood, 1965; Boyle, 1966; but see Armer and Sewell, 1966 and Haller and Sewell, 1957 for critiques) and for attending graduate school (Davis, 1964).

Work Experiences and Interests--Women with creative or exceptional interests may develop them during childhood and show this interest for many years before actually entering their chosen career (Anasrasi and Schaefer, 1969; Cutright, 1972). Although it was once suggested that women's choice of atypical careers came from some type of early deprivation or "deviant" experiences, Almqvist and Angrist (1970) suggest that a young woman's choice of atypical occupations is related more to enriching experiences, influence by people in her areas of interest, and actual experiences in a variety of fields (see also Stockard, 1974). In support of this a longitudinal study of women college graduates' post-graduation experiences found that one of the most important predictors of involvement in an atypical career later in life was earlier involvement in an area of work considered atypical for women (Bielby and Bielby, 1976).

Beyond these interests and experiences, motivation to pursue and maintain a career may be important. Harmon (1970), in fact, suggests that career commitment can be explained more by motivational factors than by circumstantial or biographical influences.

Adult Experiences--While the parental family, school, and early work experiences and interests undoubtedly have an important influence on young women's career plans and commitment, actual experiences in adulthood and women's plans for their adult life also influence their aspirations and their achievements (see Psathas, 1968). Women who are ideologically committed to continual employment, who do not

view the working of women as deviant, are more likely to be employed (Almquist and Angrist, 1975). Similarly, if women perceive their husbands to be supportive of their careers they are more likely to maintain career commitment after graduation from college (Bielby and Bielby, 1976). Being married and having children also obviously influence career plans. In fact, simply being married itself is an important influence on the extent of educational attainment (Marini, 1978; Bielby and Bielby, 1976) and career commitment. Similarly having children reduces the chances of career commitment several years after completing college (Bielby and Bielby, 1976), and fertility expectations as well as views of the importance of occupational continuity are related to occupational aspirations (Rey, et al., 1976; Stockard, 1974), although in general the tendency to decrease labor force participation with the birth of a child may be declining (Mott and Shapiro, 1978).

Conceptual Models--Figures 1 and 2 (on the following pages) give the conceptual models on which this study is based. Figure 1 outlines the decisions involved in the pursuit of a scientific career. Figure 2 summarizes various influences on career aspirations and achievements based on the above literature review.

In Figure 1 it is suggested that the decision to enter a scientific career involves first a decision to pursue higher education, an area greatly researched by those using the status attainment models. A student then must decide, however, what career field to pursue or major in as an undergraduate. Following this decision the student must decide whether or not to enter graduate training and the field of graduate training to be studied. Continually the student must decide after that point whether or not to continue to pursue that endeavor. Coinciding with these occupational and educational decisions are various decisions regarding adult family life, the outcome of which may affect the educational and occupational decisions.

Figure 2 illustrates the influences on young women's decisions to pursue

Figure 1
Decisions in the Process of Achieving a Scientific Career

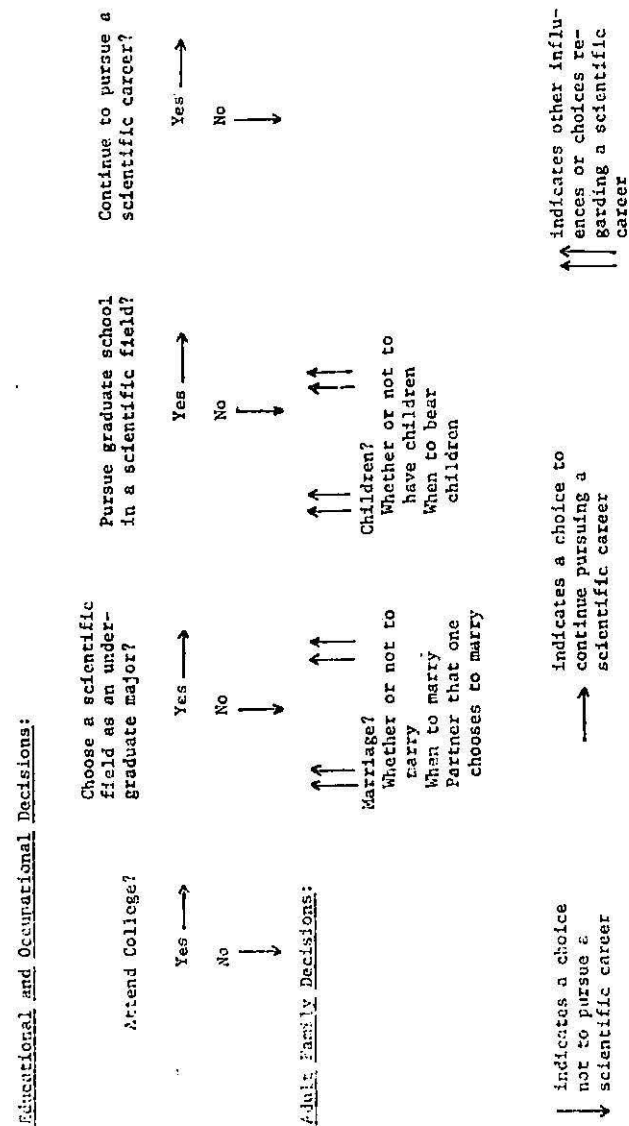
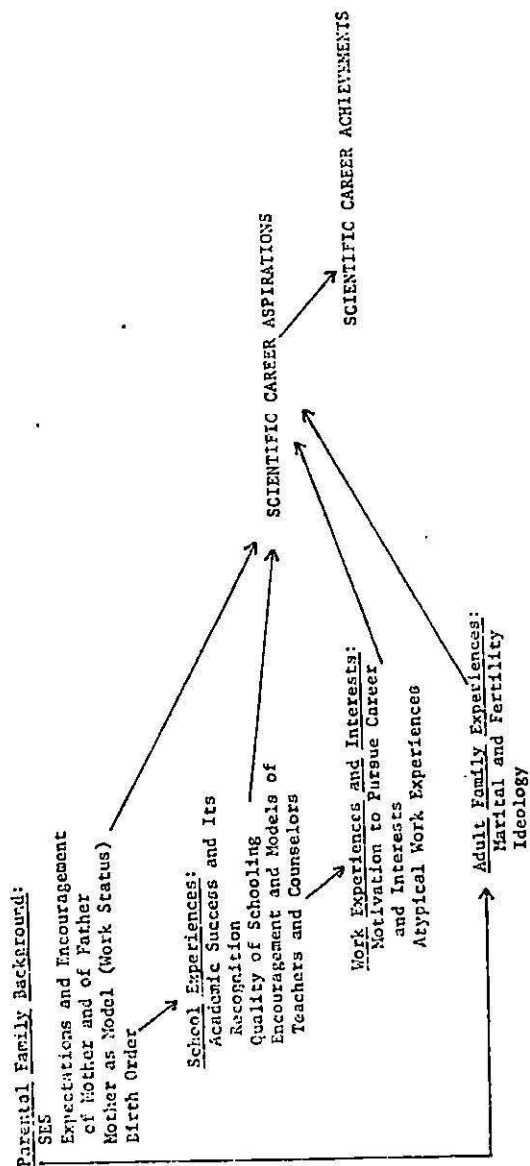


Figure 2
Influences on Career Aspirations and Career Achievements



scientific careers. It is assumed that people's aspirations and eventual achievements result from the opportunities that they have (a function of social status, previous academic and work success, and their adult family plans and experiences), from their interpretations of the expectations that others hold for them (influenced by the expectations of parents, teachers, spouses and other significant others as well as by academic success and recognition), and by their belief in their own abilities (influenced largely by earlier experiences and work history). The conceptual model groups these various influences in categories related to their source and in the time order in which they influence young women to form a block recursive model. It is hypothesized that the expectations of and experiences in the parental family, experiences in school, work experiences and both expectations for and actual experiences in the adult family will influence young women's aspirations and actual achievements in scientific careers. It is suggested that parental family experiences also influence academic success and school experiences as well as adult family experiences. It is also suggested that school experiences influence work history and interests.

Because as people grow older they encounter new significant others, have different experiences, and enter new and different situations, it is expected that the relative influence of the independent variables may alter over the years (cf., Becker, 1964). It is expected then that the parental family will be a more salient influence on the dependent variables when the women is younger and, as she gets older, work experiences and the expectations for and actual nature of the adult family will be more important influences on her aspirations. Just as it is expected that variables in the latter part of the model in Figure 2 will be more highly related to aspirations voiced later in life, it is expected that these latter variables will be more important in determining whether or not women are able to achieve their aspirations. In other words, while it is expected that expectations

of the parental family and early school experiences will be quite important in influencing early aspirations; it is expected that later experiences in school, work, and especially the support and nature of the adult family will be more important in influencing whether or not the aspirations are actually achieved.

Methodology

The present paper focuses on two major questions: 1) What is the relative importance of the parental family, school experiences, work history, and interests, and adult family expectations and experiences in influencing the level of women's educational aspirations while an undergraduate student? and 2) What is the relative impact of these variables on the sex-typed nature of women's educational aspirations? Because our sample is limited to students who are already juniors and seniors in college who are majoring in specific areas, the decision to enter college and the choice of an undergraduate major are not studied. These decisions, however, have been studied by others (e.g. Sandell, 1978).

Sample -- The sample for this study consists of women enrolled as upper division majors in the sciences and social sciences in colleges and universities in western Oregon in 1976. Part of the sample (n=125) is a self-selected group that was exposed to an NSF-sponsored program designed to encourage women to pursue scientific careers. The other half of the sample (n=120) is a group selected randomly from the same schools as those who attended the conference. The subjects have been contacted from seven to eight times since the fall of 1976 and have completed a series of questionnaires asking

about their career, family, and educational plans. About 15 percent of the subjects have also been interviewed in-depth, providing extensive additional information about their family and educational background and their plans for the future. The retention rate for the study is approximately 60 percent five years after the study's beginning.

Details on the demographic background of the respondents are given in the discussion of measures below. As would be expected with a college and university based sample, most of the respondents come from relatively privileged backgrounds and report good preparation and encouragement for their college careers. Only 6 percent of the subjects reported being non-white, and in 1976 their average age was 23.

Measures -- All of the measures come from responses in the first wave of data collection in the fall of 1976. Table 1 gives summary information on each measure of the variables in the theoretical model, and the measures are briefly described below.

Information on the parents' education and occupation is available to measure social status. The majority of the respondents report that both their mothers and fathers have attended at least some years of college. Almost a third of the fathers and a fourth of the mothers are reported to have attended graduate school.

The Bosc index of occupational prestige, which is normed for both men and women and includes the occupation of housewife, is used. Prestige calculations are based on the father's current or last job and on the mother's current job or the one that she had held the longest if she was not working outside the home at the time of data collection. The fathers' average scores are high; those of the mothers are moderate.

Measures of the expectations and encouragement of the parents come from open-ended responses to questions asking about who has or will influence future decisions and from responses to a series of Likert-type scale questions about the respondents' relationship with their mothers and fathers while in high school. Fifty-five percent of the respondents mentioned that their parents either have had or probably would have an influence on their future educational and/or career decisions. In reflecting on their relationships with their parents the average respondents reported that their parents generally respected them and encouraged independence, encouraged them to do well in competitive settings, and were warm and loving. Both mothers and fathers were reported to reject, at least somewhat, the traditional view that women's place is in the home, and both mothers and fathers were generally seen as satisfied with their lives. While respondents reported a fair amount of interaction with both parents they were more likely to talk and do things with their mothers than with their fathers.

Four variables are used to measure the parents' characteristics as models of future behavior. The mother's work history is measured by a Guttman scale noting the time periods since the respondent's birth when the mother worked outside the home. A score of zero occurs when the mother has never worked outside the home, a score of 5 occurs when the mother has worked outside the home from the respondents' infancy to her young adulthood. On the average respondents' mothers worked outside the home about half of the time from infancy on, almost always as the respondent got older. A measure of the family division of power is derived from two Likert-scale type questions. The most frequent response was that mothers and fathers had

approximately equal voices in family decisions and the next most common response was that fathers made somewhat more decisions. Perceived similarity to the mothers and to the fathers are both Likert-type scales. The average scores indicate that respondents generally saw themselves as somewhat like both their mothers and fathers.³

The measures related to school experiences show that more than one-half of the students have transferred from one school to another during their college career. On the average, respondents had relatively good high school and college grades, attended high schools of moderate size, mainly in the Pacific Northwest, and were about evenly divided between publicly and privately supported colleges. Only one-fourth of the respondents reported enrollment in special coursework related to career planning, although 70 percent of the respondents reported talking with counselors and/or advisors about career plans, and 41 percent mentioned that teachers, professors, and/or counselors had influenced their future plans.

It was earlier hypothesized that students' interests and experiences influence their educational aspirations and decisions. When asked what had influenced their decisions 82 percent mentioned travel and other experiences in their daily lives, 53 percent mentioned work experiences, and 32 percent mentioned professionals in their chosen field. When asked why they had chosen a particular career goal, 51 percent mentioned that the job involved working with people or an opportunity to help or "contribute" in some way; 76 percent mentioned that they had abilities and interest in the chosen field; and 15

³ Birth order and family size are not included in this analysis because unfortunately the measures were not obtained until a later wave of data collection and to include them could substantially affect the sample size. Later analyses will include those measures.

percent mentioned personal, family, or geographic reasons.

The majority of the respondents planned to marry and have children in the future, although marriage plans were somewhat more common than desires for children. Only 12 percent of the sample had already been married by 1976, and only 8 percent already had children. Twenty-seven percent of the respondents mentioned that their fiancé, spouse, and/or children had influenced or probably would influence their career and educational decisions.

Three measures of views regarding women's roles are used. The first is a fairly general measure of attitudes toward the role of women that has been used in other studies (e.g. Stockard, 1974; 1980; Johnson, et al, 1980). On this scale the respondents report fairly feminist attitudes. The two other measures involve the respondents' views of their own sex roles in the future. When given a choice of three alternative styles of combining a career and a family the vast majority said that in ten years they would ideally devote equal attention to their families and careers; 11 percent said that their families would receive more attention; and 18 percent said that their careers would receive first priority. When asked how often they would ideally choose to work in the future if they had a family the vast majority reported that they would always choose to work outside the home.

Measures of the dependent variable come from questions regarding the level of the respondents' ultimate educational goal and their major field of study. Exactly half of the respondents reported that they aspired to a Masters' degree, 30 percent aspired to a Ph.D. or a graduate professional

degree and 20 percent aspired to a Bachelors degree or non-graduate job related training. The sex-typed nature of the goal is measured by the proportion of men receiving degrees at the level and in the field chosen by the respondents as their ultimate goal. Thus, a higher score on this measure indicates a more male-typed goal. On the average the respondents aspired to fields that had 68 percent male graduates in 1976.⁴

Analysis -- In this paper simple multiple regression is used to assess the relative influence of the independent variables on the model.⁵ A step-wise regression model was used with the stipulation that only variables with an F-ratio greater than or equal to 1.0 were to enter the model. Only respondents with measures on each variable are included. Although this decreases the sample size it assures that all correlations in the analysis are based on the same subjects. Comparison of the average scores on each measure of the analysis subgroup with the total sample indicates that there are no consistent or significant differences in central tendency.

Although the average age of the respondents in 1976 was 23 the respondents ranged from 18 to 48 years of age. It is possible that age-related variations in opportunities and experiences could cause systematic differences in the influences on the aspirations of the older and younger subjects. Therefore the analysis is conducted with the total group and with the subsample of respondents who were born in 1949 or later. The average age of this subgroup is 22 years in 1976.

⁴ Since 1976 some fields, such as business administration, have experienced a rapid increase in female participation. Because our analysis considers aspirations in 1976 it was felt that a measure reflecting the sex-typed nature in the field at that time was most appropriate.

⁵ It is recognized that a number of our variables are measured on an ordinal, rather than an interval, scale. However, we follow the usual convention of treating these variables as though they were intervally measured, being careful to retain as much variation as possible in the measures.

The present analysis does not take into account the complexity of the model in Figure 2. Only one dependent variable is considered and the effects of the independent variables on intervening variables are ignored. Later analyses will utilize structural equation models that can effectively and efficiently deal with these complexities. Later analyses will also use more of the qualitative data available on the questionnaires and from the interviews.

Results

The models of influences on the level of the respondents' educational aspirations and on the sex-typing of their aspirations are discussed below.

Influences on Level of Aspiration -- Tables 2 and 3 give the correlations among the variables found to influence the level of the respondents' educational aspirations, both when all the subjects are included (Table 2) and when only those born after 1948 are studied (Table 3). In both cases the matrix can best be described as thin with the correlations ranging in size from very low to moderate. Correlations with the dependent variable range from a low of zero with similarity to the father (Table 2) to highs of -.33 and -.37 (Tables 2 and 3 respectively) with the respondents' ideal view of their future life styles. With correlations among the independent variables the largest involve the mothers' and fathers' sex role attitudes (.49 in Table 2 and .50 in Table 3) and general attitudes toward the role of women with views of the ideal life style in the future (-.40 in Table 3) and future work plans (.43 in Table 3).

Table 4 gives the results of the multiple regression with both subgroups. When adjusted for the sample size the R^2 indicates that close to

one-third of the variation in level of educational aspirations is explained. Variables from each of the four main areas of the model help explain the level of the respondents' aspirations, although some variables are much stronger predictors than others.

Looking first at the results when all subjects are included it may be seen that among the variables associated with the parental family a lower mother's education, less encouragement of achievement by the father, a warmer mother-daughter relationship, a father's traditional sex-role attitudes but a mother's liberal attitudes, a father's dissatisfaction with his life and greater perceived father-daughter similarity all influence higher aspirations. Of these variables the most significant influences are from the mother's and father's attitudes. The effect of the mothers' education is of marginal significance and the other influences do not reach significance at the usual levels. The mothers' and fathers' sex role attitudes have a strong positive correlation with each other, but are correlated with the dependent variable in opposite directions. This results in strong indirect effects that enhance the direct influence in opposite directions of each parents' views on the daughters' aspirations. At the zero-order level mothers' education has a slight positive correlation with level of aspirations, but once the other variables in the model, and especially the mothers' sex role attitudes, the type of college attended, and the high school grades, are taken into account the actual influence of mothers' education on the daughters' aspirations is moderately sized and negative.

Among the school related variables higher grades in high school, attending a larger high school and a private rather than a public college,

reporting enrollment in career related school programs or career planning activities, and receiving encouragement from school personnel influence higher aspirations. Only the effect of high school size is significant at the .05 level, although the influence of the type of college attended is significant at the .10 level.

Among the variables related to work experiences and interests, mentioning the influence of travel and general living experiences, the influence of professionals in the chosen field, and that one wants to enter a field because it involves people or the opportunity to "contribute" all influence having higher aspirations. Of these variables only the last is significant ($p < .10$). Interestingly enough, its zero-order correlation with the dependent variable ($r = .22$) is much higher than the standardized regression weight ($\beta = .13$), indicating that a substantial portion of the variable's influence on educational aspirations is indirect. Most of the indirect effect is channeled through associations of mentioning the nature of the job with the mother's more liberal sex role attitudes and the father's greater dissatisfaction with life.

Of the variables related to the respondents' adult family plans and experiences, planning not to marry, idealizing a less traditional family life style, planning to work at all stages of the family life cycle, and having more liberal attitudes toward women's roles all influence having higher aspirations. Although each of these variables has a zero-order correlation with the level of aspirations that is equal to or greater than .25 and highly significant, only the influence of the idealized life

style retains this high significance level in the multiple regression. The influence of work plans is significant at the .10 level. Most of the influence of marriage plans, general attitudes toward the role of women, and future work plans is indirect, accounted for by the correlations among all the variables in this section as well as their association with the respondents' perception of their fathers' dissatisfaction with life.

Overall, in this analysis, the most important influences on the level of educational aspirations are the fathers' and mothers' sex role attitudes and the respondents' views of their ideal family life style in the future. Even though the dependent variable directly concerns educational decisions, variables regarding work and school experiences are much less important.

When only respondents born in 1949 or later are included in the analysis the results are similar to those found with the total group, but somewhat simpler. Again the adjusted R^2 indicates that about one-third of the total variation is explained, and variables from each of the main sections of the hypothesized model enter into the analysis.

Of the variables involving the parental family a warmer mother-daughter relationship, more traditional sex role attitudes of the father, but less traditional attitudes of the mother, and a mother who is felt to be more dissatisfied with her life all influence higher aspirations. Of these independent variables only the effect of fathers' sex role attitudes is highly significant, although the effect of the mother-daughter relationship is significant at the .10 level. At the zero-order level the mothers' dissatisfaction with life is moderately correlated with higher aspirations ($r = .22$)

but in the multiple regression this influence drops substantially ($\beta = .11$), largely through the association of the mothers' greater dissatisfaction with the daughters' less traditional ideal future life style and her desires to avoid marriage and to work steadily in the future. The influence of the fathers' attitudes rises substantially from the zero-order level, primarily because of the association of the fathers' traditional attitudes with the mothers' traditional attitudes and a less warm father-daughter relationship.

Of the school related variables, having a higher grade average in college, attending a larger high school, enrolling in courses or projects related to career goals, engaging in career planning activities and receiving encouragement from school personnel all influence higher aspirations. Only the influence of enrolling in special projects is significant ($p < .10$).

Of the job related variables, reporting the influence of travel and other life experiences and the influences of professionals in the chosen work field both influence higher aspirations with the influence of the latter variable being significant at the .05 level.

Finally, of the variables related to adult family expectations and experiences a lower desire for marriage but greater plans for having children, a less traditional idealized future life style, and more continuous work plans all independently influence higher aspirations. The influence of the idealized life style is significant at the .001 level, the influence of work plans is significant at the .05 level, and the influence of marriage plans is significant at the .10 level. Even though the influence of fertility plans is not significant at the standard levels it should be noted that its

influence is in a direction opposite to that which is expected and reverses the influence found in the zero-order correlations. Examination of the correlation matrix indicates that the reversal occurs when the other adult family related variables are controlled and that once future work plans, idealized life style, and future marriage plans are taken into account, there is a slight trend for respondents who desire children in the future or who already have them to more often have higher educational aspirations.

Influences on Sex-Typing of Educational Aspirations -- Table 5 gives the correlations among the variables in the models explaining the sex-typing of the respondents' aspirations. Again the matrices are noticeably thin. None of the correlations with the dependent variable is greater than .20 and the only sizeable correlations among the independent variables involve college and high school grade averages and the variables regarding the parental family.

Table 6 gives the results of the multiple regression. The variables in the model explain much less variation of the sex-typing of the aspirations than of the level of aspiration. The adjusted R^2 shows that only 8 percent of the variation is explained. This is significant at the .01 level for the model with only the younger subjects but at only the .05 level for the total group. Variables from each group in the theoretical model influence the sex-typed nature of aspirations, but their influence varies. We first examine results with the total group.

Of the independent variables related to the parental family a lower education of the mother, but higher prestige of the fathers' occupation, more traditional sex role attitudes of the father but more liberal attitudes

of the mother, and a more continuous work history of the mother all influence aspiring to more masculine educational areas. Of these variables only the influence of the mothers' education is significant at the .10 level. Its influence is enhanced from the zero-order correlation by especially the indirect effect of the mothers' sex role attitudes and the respondents' high school grades.

Of the school related variables having higher high school grades but lower grades in college, attending a larger high school and participating in career planning activities all influence choosing more masculine fields. The influence of both the high school and college grades is significant. Largely because of the high positive correlation between high school and college grades the opposite effect of each of these variables is enhanced, in a manner similar to the effect of the parents' sex role attitudes.

Of the variables related to interests and work experiences only mentioning the influence of work-related experiences is important, but its effect does not reach traditional levels of significance.

Finally, of the variables related to adult family experiences only the respondents' less traditional idealized views of their future life styles influence more male-typed educational aspirations. Again, however, this influence is insignificant.

The results with only the younger subjects are similar to those discussed immediately above except that the parents' sex role attitudes, mothers' work history and the size of the respondents' high school do not enter the model. Citing geographic and family related factors as reasons for choosing goals enters the model, but is insignificant. The only significant influences are those of high school and college grades and reporting participating in career planning activities.

Discussion

Although variables from each part of the theoretical model influence the level of educational aspirations and the sex-typing of the aspirations, the influences are not uniformly important and do not always occur as hypothesized. The results also differ somewhat for the total sample and the younger subjects and differ more sharply for the two dependent variables.

The parent related variables, and especially parental attitudes, are generally more important in explaining the level of aspirations than the sex-typing of the aspirations. Only mothers' education is a significant influence for both dependent variables and in a direction opposite to that which would be expected if higher status were to influence higher aspirations. We suspect this negative influence occurs because the sample is limited to college students. Higher social status may be important in influencing college attendance, but among those in college those with lower status origins may be more motivated to attain higher levels. This explanation, however, does not explain why it is the mothers' education rather than the fathers' that is the important influence.

The opposite effect of the fathers' and mothers' attitudes toward sex roles was unexpected, yet with the analysis of level of aspirations the influences are highly significant. In fact, the influence of the fathers' traditional attitudes on higher aspirations is greater than the influence of the mothers' more liberal attitudes. Perhaps, to at least some extent, aspiring to higher levels of education represents a rejection of the fathers' views but an acceptance of the mothers' views regarding women's roles.

Of the other measures of the parents' encouragement and expectations only that of the quality of the mother-daughter relationship has a significant

influence on the younger subjects' level of aspirations. Perhaps this variable influences the aspirations of only the younger subjects because the period of close parent-daughter contact is closer to their present experiences. It is also expected from earlier studies (e.g. Stockard, 1974) that the variables in this category will influence the intervening variables in the model such as attitudes toward women's roles and thus may indirectly affect aspirations.

None of the variables regarding the parents as models reached levels of significance. Again these variables may be more important in influencing the intervening variables than the dependent variables and their full importance will only become clear in an analysis using structural equations.

The school related variables are somewhat more important in influencing the sex-typed nature of the aspirations than the level of aspirations. In fact, high school and college grades are the only significant influences on the sex-typed aspirations of the younger subjects. It is interesting that better high school grades, but lower college grades independently influence more male-typed aspirations. Perhaps this result is related to the undergraduate majors of the respondents. Better high school grades may influence choosing more male-typed undergraduate majors. Yet grading patterns in those areas may be somewhat more severe, leading to the association between lower grades in college and aspirations to more male-typed areas.

Attending a larger high school affects both higher aspirations and more male typed aspirations of the entire sample. The effect on level of aspirations is significant and perhaps reflects the influence of urban backgrounds on general status attainment.

Of the various measures regarding enrollment in career related courses and participation in other planning activities only the enrollment in courses, internships, or practicums is significant when it affects the level of aspirations of the younger subjects. Yet, several of these measures enter the models. Perhaps if they were examined as joint, rather than independent, influences their effect would be more accurately measured.

Attending a private rather than a public college influences higher aspirations of the total sample. The public/private distinction, however, only approximates a measure of the quality of the college attended and it could well be that a measure using more details on the colleges' quality would be of greater use.

None of the variables related to work experiences and interests has a significant effect on the sex-typing of the aspirations. Mentioning the characteristics of the job aspired to, whether it involves working with people or an opportunity to "contribute," influences higher aspirations for the entire sample. Mentioning the influence of professionals affects the level of aspirations of the younger subjects. We are unsure why these different results occur with the two subsamples. The measures for this area of the model are probably the weakest of any in the analysis, all coming from responses to open-ended questions. Thus the results here may not reflect the actual theoretical importance of these variables. Analyses that use the qualitative data more directly may help remedy this problem.

Variables regarding adult family experiences and expectations have significant influences only on the level of aspirations. Most of the influences are in the expected direct. The only exception is the influence of plans to have children. For the younger respondents, once

marriage and work plans and views of the ideal life style are controlled, a greater desire to have children influences higher levels of aspirations. Perhaps this does not reflect traditional ideology, which is tapped by the other measures, but simply general ambition in the family as well as in the educational world.

Of the variables related to the adult family the respondents' idealized view of their future life style is most important, while future work plans and marriage plans have significant, but much smaller influences. The view of an idealized life style is the most specific of the measures in this area and thus may be closer to tapping the respondents' life priorities than simply whether or not they plan to marry or work continuously.

Finally, it is important to note that substantially more variation is explained in the level of aspirations than in the sex-typing of the aspirations, suggesting that our model may need to be substantially modified to explain the latter variable adequately. Interestingly enough, it is the sex-role related measures (attitudes of the parents and adult family plans of the respondents) that most influences the level of aspirations, a variable usually studied within a status attainment, rather than a sex-role model. The important influences on the sex-typing of aspirations are the high school and college grades and not the variables commonly used in examinations of sex roles. This suggests that a greater overlap of explanatory models could benefit both types of studies.

Table 1

Summary Statistics on Variables Used in the Analysis

I. Parental Family Background

A. Socioeconomic Status

1. Parents' Education	Mothers	Fathers
1. Less than high school	7%	10%
2. High school graduate	28%	21%
3. Some college	20%	14%
4. College graduate	23%	24%
5. Graduate work	22%	31%
Mean	3.25	3.46
standard deviation	1.26	1.37
n	243	242

2. Occupational Prestige

	Mothers	Fathers
Mean	52.2	85.8
Standard deviation	24.1	35.0
n	240	239

B. Expectations and Encouragement of Mother and Father

1. Parents have had or will have influence on future decisions
 1 = yes -- 55%
 0 = no -- 45% n = 245

2. Encouragement of Competence: An eight item Likert-type scale for each parent. A lower score indicates greater encouragement.

	Mothers	Fathers
Mean	13.8	14.8
Standard deviation	4.9	4.8
n	237	222
coefficient alpha	.91	.90

3. Encouragement of Achievement and Competitions: A three item Likert scale for each parent. A lower score indicates greater encouragement

	Mothers	Fathers
Mean	6.2	6.4
Standard deviation	2.0	2.2
n	240	224
coefficient alpha	.77	.75

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Table 1 (page 2)

4. Warmth and Quality of the Parent-Daughter Relationship:
A three item Likert scale for each parent. A lower score indicates a warmer relationship

	Mothers	Fathers
Mean	9.8	11.7
Standard deviation	3.5	4.3
n	236	222
coefficient alpha	.85	.89

5. Frequency of Parent-Daughter Interactions: a two item scale for each parent. A lower score indicates greater interactions.

	Mothers	Fathers
Mean	3.9	5.8
Standard deviation	2.2	2.5
n	243	235
coefficient alpha	.83	.82

6. Parents thought women's place was in the home: 1 = very true; 4 = very untrue.

	Mothers	Fathers
Mean	3.09	2.94
Standard deviation	.88	.92
n	243	229

7. Parents seemed satisfied with life: 1 = very true; 4 = very untrue

	Mothers	Fathers
Mean	2.36	2.09
Standard deviation	.96	.90
n	243	231

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Table 1 (page 3)

C. Parents as Models

1. Mothers' work history: Number of time periods mother worked outside the home since the respondents' birth: 0 = never; 5 = all time periods.
Mean = 2.5; standard deviation = 1.9, n = 245
A Guttman scale, coefficient of reproducibility = .91

2. Parents' division of family power:

1 = father makes most of decisions	19%	19%
2 = father makes more decisions than mother		25%
3 = father and mother make about same number of decisions		38%
4 = mother makes more decisions than father		18%

3. Perceived similarity to parents: a three item Likert scale.
A lower score indicates greater similarity to parents.

	Mother	Father
Mean	7.8	7.6
Standard deviation	2.1	2.1
n	234	220
coefficient alpha	.74	.73

II. School Experiences

A. Academic Success and Its Recognition

1. Pattern of college enrollment
0 = attended one school 44% n = 245
1 = attended more than one school 56%
2. Participation in special programs or projects including internships, courses, practicums, career planning workshops
0 = no 75%
1 = yes 25% n = 245

Grades	High School	College
Mean	3.5	3.2
Standard dev.	0.4	0.4
n	231	231

Table 1 (page 4)

B. Quality of Schooling

1. Size of high school, measured by number of students
mean = 313, standard dev. = 162, n = 236
2. Location of high school
0 = outside Pacific Northwest 30%
1 = in the Pacific Northwest 70% n = 245
3. Type of college
0 = privately supported 47%
1 = publicly supported 53% n = 245

C. Encouragement of Teachers and Counselors

1. Reported encouragement from teachers, professors, and/or counselors
0 = no 59%
1 = yes 41% n = 245
2. Reported career planning activities including use of career information files, talks with counselors, talks with advisors, and other career information procedures
0 = no 30%
1 = yes 70% n = 245

III. Work Experiences and Interests

A. Interests

1. Mention travel and general living experiences as an influence
0 = no 18%
1 = yes 82% n = 245
2. Mention that job involves people or an opportunity to "contribute"
0 = no 49%
1 = yes 51% n = 245
3. Mention ability or interest in field aspired to
0 = no 24%
1 = yes 76% n = 245
4. Mention personal, family, geographic reasons for aspirations
0 = no 85%
1 = yes 15% n = 245

Table 1 (page 5)

B. Work Experiences

1. Mentions work experiences as an influence on aspirations
0 = no 47%
1 = yes 53% n = 245
2. Mention professionals in the field as an influence
0 = no 68%
1 = yes 32% n = 245

IV. Adult Family Experiences and Expectations

A. Marriage and Children

1. Plans for Marriage and Children in the future

	Marriage plans	Plans for children
1. Definitely plan or already	40%	23%
2. yes, probably	38%	43%
2.5 maybe (added by respondents)	5%	4%
3. no, probably	11%	22%
4. no, definitely	6%	20%
n	234	241

2. Perceived influence of spouse and family on plans: Mention that fiance, spouse and/or children have or will influence plans
0 = no 73%
1 = yes 27% n = 245

B. Ideology

1. General views of Women's roles: an eight item Likert scale.
Mean = 34.2, standard deviation = 4.6, n=237, coefficient alpha = .81
2. View of ideal life style in ten years
1 = career would have priority over family life 18%
2 = career and family would have equal priority 71%
3 = family would have priority over career 11%
3. Periods in the family life cycle when respondent would choose to work in the future: 1 = never; 6 = always
mean = 5.4, standard deviation = 1.1, n = 241

Table 2
Correlations Among Variables in the Model of Influences on the Level of Educational Aspirations--All Subjects

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1.	1.00																				
2.	.03	1.00																			
3.	-.17	.17	1.00																		
4.	.24	-.07	-.21	1.00																	
5.	.30	-.13	-.24	.49	1.00																
6.	.04	.02	.11	.00	.08	1.00															
7.	-.09	.23	.20	-.07	.00	.44	1.00														
8.	.01	.07	.13	.04	.06	.07	1.00														
9.	.13	-.26	-.05	-.11	-.07	-.07	-.20	.07	1.00												
10.	.05	-.08	.08	-.02	.02	.00	.04	-.04	.09	1.00											
11.	-.26	.12	.18	-.02	-.08	.22	.21	.08	-.26	.16	1.00										
12.	-.02	-.06	-.12	.12	.16	-.04	-.04	-.02	.04	-.02	-.08	1.00									
13.	-.06	-.16	-.12	.12	.05	.12	-.12	.10	.09	-.07	.24	.10	1.00								
14.	.07	-.03	.02	.19	.00	.07	.02	.25	.00	.10	-.05	.19	.03	1.00							
15.	.14	-.05	-.07	.11	.14	.22	.07	.15	.04	.01	-.02	.06	.05	.20	1.00						
16.	.22	-.14	.03	.01	.08	-.03	-.11	.02	.12	.04	-.21	-.03	.04	.11	-.02	1.00					
17.	.14	-.05	.04	.12	.01	.20	.16	.05	-.06	.01	.00	.08	.00	.09	.16	-.02	1.00				
18.	.12	-.05	.17	.12	.13	.28	.22	.16	-.08	-.01	.14	-.01	-.03	.10	.04	.09	.27	1.00			
19.	-.02	-.02	-.13	-.04	.00	-.03	-.16	.01	.08	.11	-.11	-.07	.01	-.06	-.03	.02	-.36	-.40	1.00		
20.	.09	-.11	.03	.05	.10	.23	.05	.05	.12	.03	.08	-.15	.05	-.11	.06	-.07	.27	.43	-.14	1.00	
21.	.04	-.08	-.03	-.11	.16	.18	.00	.10	.17	.11	-.11	.15	.15	.14	.22	.10	.25	.26	-.33	.25	1.00

Variables are 1) mothers' education; 2) fathers' encouragement of achievement; 3) warmth of mother-daughter relationship; 4) fathers' sex role attitudes; 5) mothers' sex role attitudes; 6) fathers' satisfaction with life; 7) perceived similarity to the father; 8) participation in career planning projects (eg internships); 9) high school grades; 10) high school size; 11) college type; 12) encouragement by school personnel; 13) career planning activities (e.g. use of career files); 14) travel and living experiences mentioned as influence; 15) job involving people or chance to contribute seen as influence; 16) professionals in field mentioned as influence; 17) plans to marry in future; 18) general attitudes toward roles of women; 19) idealized view of future life style; 20) future work plans; 21) level of educational aspirations

Table 3
Correlations Among Variables in the Model of Influences
on the Level of Educational Aspirations -- Subjects born after 1949

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.	1.00															
2.	-.20	1.00														
3.	-.21	.50	1.00													
4.	.30	.05	.15	1.00												
5.	.08	.10	.04	.09	1.00											
6.	.03	-.15	.06	.06	.03	1.00										
7.	.10	-.04	-.04	-.02	-.02	.06	1.00									
8.	-.13	.11	.16	-.02	-.04	.16	-.03	1.00								
9.	-.17	.08	.10	-.08	.09	.17	-.04	.25	1.00							
10.	.00	.13	-.01	.17	.24	.01	.07	.16	-.03	1.00						
11.	.04	-.01	.09	-.01	-.02	-.01	.10	-.05	.03	.12	1.00					
12.	.01	.13	.09	.23	.05	-.02	.03	.07	-.08	.06	-.03	1.00				
13.	.16	.01	.02	.11	.17	.01	.01	-.08	-.05	-.06	.07	.32	1.00			
14.	-.08	-.11	-.09	-.24	.03	.01	.11	-.08	.03	-.04	.03	-.34	-.37	1.00		
15.	.06	-.01	.13	.20	.08	.07	.06	-.16	-.01	-.11	-.09	.24	.18	-.20	1.00	
16.	-.06	-.15	.13	.22	.12	.18	.05	.16	.16	.11	.14	.27	.10	-.37	.27	1.00

Variables are 1) warmth of mother-daughter relationship; 2) fathers' sex role attitudes; 3) mothers' sex role attitudes; 4) mothers' dissatisfaction with life; 5) participation in career planning projects such as internships; 6) college grades; 7) high school size; 8) encouragement by school personnel; 9) career planning activities such as using career files; 10) travel and living experiences mentioned as influence; 11) professionals in field mentioned as influence; 12) marriage plans; 13) plans for having children; 14) idealized future life style; 15) future work plans; and 16) level of educational aspirations

Table 4

Multiple Regression of Model Variables on
Level of Educational Aspirations

Independent Variables	All Respondents	Only Respondents Born in 1949 or Later
	Standardized Regression Coefficient (β)	Standardized Regression Coefficient (β)
Mothers' education	-.14 *	
Fathers' encouragement of achievement	.11	
Warmth of mother-daughter relationship	-.10	-.14 *
Fathers' sex role attitudes	-.31 ****	-.34 ****
Mothers' sex role attitudes	.26 ***	.15 *
Fathers' life dissatisfaction	.12	
Mothers' life dissatisfaction		.11
Similarity to father	-.11	
Enrollment in career related projects or courses	.07	.15 *
High school grades	.12	
College grades		.09
High school size	.16 **	.07
College type	-.14 *	
Encouragement of school personnel	.07	.10
Participation in career planning activities	.10	.12
Mentioning travel and living experiences as important	.09	.05
Mentioning people and "contrib- uting" as important	.13 *	
Mentioning professionals as important influences	.09	.16 **
Marriage plans	.10	.15 *
Plans to have children		-.11

Table 4 (page 2)

General sex role attitudes	.09	
Ideal future life style	-.32 ****	-.34 ****
Future work plans	.14 *	.17 **
R ² , adjusted for sample size	.32 ****	.33 ****
N	151	140

* p .10
** p .05
*** p .01
**** p .001

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Table 5

Correlations Among Variables in the Model of
Influences on Sex-Typing of Educational Aspirations

All Subjects

	1	2	3	4	5	6	7	8	9	10	11	12
1. Mother's education	1.00											
2. Prestige of father's occupation	.23	1.00										
3. Father's sex role attitudes	.24	.08	1.00									
4. Mother's sex role attitudes	.30	.07	.49	1.00								
5. Mother's work history	.21	-.03	.31	.20	1.00							
6. High School grades	.13	.06	-.11	-.07	.00	1.00						
7. College grades	-.05	-.09	-.15	-.08	-.05	.36	1.00					
8. High school size	.05	.03	-.02	.02	.10	.09	.04	1.00				
9. Career planning activities	-.06	.05	.12	.05	.05	.09	.17	-.07	1.00			
10. Work experiences influential	.13	.11	.10	-.05	.04	.02	.03	.11	-.10	1.00		
11. Ideal future life style	-.02	-.02	-.04	.00	.02	.08	.01	.11	.01	.02	1.00	
12. Sex-typing of educ. aspirations	-.04	.11	-.03	.05	.08	.20	-.07	.12	.11	.09	-.06	1.00

Respondents Born in 1949 or Later

	1	2	3	4	5	6	7	8	9
1. Mother's education	1.00								
2. Prestige of father's occupation	.22	1.00							
3. High school grades	.11	.04	1.00						
4. College grades	.00	-.07	.42	1.00					
5. Career planning activities	.00	.04	.09	.17	1.00				
6. Work experiences influential	.13	.09	.02	.04	-.13	1.00			
7. Geographic and family consider.	-.11	-.05	-.11	.05	.00	-.02	1.00		
8. Future work-plans	.06	-.03	.10	.07	-.01	-.14	.07	1.00	
9. Sex-typing of educ. aspirations	-.06	.12	.19	-.05	.12	.08	.09	.11	1.00

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Table 6

Multiple Regression of Sex-Typing of Aspirations
on Model Variables

	All Respondents	Only Respondents Born in 1949 or Later
Independent Variables	Standardized Regression Coefficients (β)	Standardized Regression Coefficients (β)
Mothers' Education	-.15 *	-.12
Prestige of Fathers' Occupation	.10	.11
Fathers' sex role attitudes	-.13	
Mothers' sex role attitudes	.14	
Mothers' work history	.10	
High school grades	.27 ***	.27 ***
College grades	-.20 **	-.20 **
High school size	.10	
Enrollment in career related projects or courses	.13	.14
Geographic and family considerations are important		.13
Work experiences mentioned as influence	.12	.11
Ideal future life style	-.11	
Future work plans		.12
R ² adjusted for sample size	.15 **	.13 ***
N	151	140

* p .10
** p .05
*** p .01
**** p .001

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