The Consequences of Career Choice: Family and Income Disparities Among Women in Science and Other Elite Professions

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The Consequences of Career Choice: Family and Income Disparities Among Women in Science and Other Elite Professions

ABSTRACT

Women now attain bachelor's and graduate degrees at rates that equal or exceed rates for men. Despite this progress, sex segregation in fields of study persists. Men are more likely than women to major in science, particularly physical science and engineering, and data indicate that gender convergence among science majors is not likely in the near future. Women's choices to enter into science or not, and to enter into physical science or engineering versus other elite professions may be due to their assessment of different levels of compatibility with family goals for various prestigious careers. Using data from the 1980 to 2000 Census and the 2009 American Community Survey, we analyze trends over time in highly-educated women's occupational choices and the consequences of their choices in terms of marriage, fertility and earnings. We find that the women in science professions earn less than women in other elite professions, like medicine, law and business, but do not experience drastically different family arrangements or wage penalties for having children compared to other elite professions.

The Consequences of Career Choice: Family and Income Disparities Among Women in Science and Other Elite Professions

Women now attain bachelor's, master's, professional, and doctoral degree at rates that equal or exceed men's rates (for a review, see Buchmann, DiPrete and McDaniel 2008). Their representation in high status professions in many branches of science as well as other elite occupations has increased substantially in recent decades. Women have garnered slightly more than half of all bachelor's degrees in science and engineering awarded annually since 2000 (National Science Foundation 2009), but inspection of specific fields within the broad category of science and engineering reveals great variation in women's representation. Women now comprise the majority of students completing bachelor's degrees in the agricultural sciences, biological sciences, chemistry, and ocean sciences, but remain the minority in nearly all other science and engineering fields (see Figure 1). This pattern underscores persistent sex segregation in fields of study generally, and the sciences in particular (Turner and Bowen 1999; Charles and Bradley 2002; 2009).

FIGURE 1 ABOUT HERE

Why do women remain underrepresented in many science fields? Explanations for the persisting shortfall of women in some fields of science, and the physical sciences and engineering in particular, must consider the consequences for women's field of study for both their careers and family lives. Women's choices to enter into science or not, and to enter into physical science or engineering versus life science may be due to their assessment of different levels of compatibility with family goals for various prestigious careers. Using a life course perspective, Xie and Shauman (2003) recognize that individual decision-making and structural constraints interact in complex ways to shape the educational and career trajectories of individuals. The life course is comprised of different, interconnected trajectories in the domains of education, family and career. Events and changes in one domain often affect the course of the trajectories of other domains. Individuals make career choices not simply on the basis of job-specific values (i.e., the type of job they want to have), but in terms of values pertinent to other salient social roles. Thus, gendered patterns in college majors and career trajectories should be determined not only by intrinsic interests, but also by considerations about life goals regarding family formation and career-family balance. Many young women may perceive predominantly female branches of study to fit better with gendered norms related to family formation (Hakim, 2000; Lappegård, 2002; Lappegård and Rønsen, 2005) and these perceptions, in turn, shape their career decisions.

Prior research does not consider whether the consequences for women's career choices in sciences and engineering are different from those in other science-related or other elite careers. Instead, in searching for answers to the question of why many science fields fail to attract more women, most prior research focuses exclusively on the experiences of female science majors and scientists (National Research Council, 2006; National Science Foundation, 2004; Zuckerman et al., 1992; Davis, 1996; Valian, 1998; Hanson, 1996; Brainard and Carlin, 1997; Fox and Stephan, 2001). Thus, we do not know whether the popularity of different careers for women is related to differences in perceived or actual career-family incompatibilities of these fields or differences in their appeal to the women due to intrinsic features of these fields. Our research considers the broader occupational environment in which other elite career options are increasingly available to women and examines the degree to which differences in work-family tradeoffs exist in different elite occupations for women. Using data from the 1980, 1990, and 2000 Integrated Public-Use Microdata from the Census as well as 2009 American Community Survey we analyze trends over time in highly-educated women's representation in a variety of science and non-science elite professions. We also compare the marriage and fertility statuses and average earnings of women within these different occupational categories. We examine if a penalty for having a young children exists for women's work hours and income across occupations and conduct OLS regressions for each occupation to determine the degree to which family status contributes to income inequalities. Finally, we decompose income inequality by family status for different science and elite occupations.

Trends in Women's Participation in Higher Education and Science

The slow rate of progress of women in some fields of science and engineering contrasts with their rapid progress in higher education in general. By 2000, women received 57% of all bachelor's degrees and this gap has remained stable to the present (Buchmann and DiPrete 2006: Snyder and Dillow 2010).[1] Currently, women are more likely than men to attend graduate school and they earned 61% of all master's degrees and 51% of doctoral degrees in 2008, the most recent year for which data are available

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[1] Prior research has stressed both micro-level, individual factors as well as macro-level, institutional factors to explain the growing female advantage in college completion. Micro-level explanations focus on gender differences in cognitive and non-cognitive skills and the effect of family background on educational attainment (Buchmann and DiPrete, 2006; Reynolds and Burge, 2008; Jacob, 2002; Goldin et al., 2006). Notable institutional-level forces include the spread of egalitarian norms, structural changes in higher education, and women's rising labor force participation rates as well as rising gender-specific returns to a college degree (Buchmann and DiPrete, 2006; Goldin et al., 2006).

(Snyder and Dillow 2010). Similar trends have occurred within professional degrees. In 1970, women earned 8% of medical degrees, 5% of law degrees, and 1% of dentistry degrees (Freeman 2004). In 2008, women earned 49% of medical degrees, 47% of law degrees, and 45% of dentistry degrees, (Snyder and Dillow 2010).

The number of degrees earned by women has increased dramatically across all fields in recent decades, women have made strides to close the gender gap in science. The top panel of Figure 2 presents the total number of bachelor's degrees awarded to men and women in science and engineering (S&E) and non-science and engineering (non-S&E) fields from 1989 to 2008. While women far surpass men in the number of non-S&E degrees earned, it is also striking that women have attained parity with men in attaining bachelor's degrees in S&E fields. A male-favorable gender gap in S&E bachelor degree attainment existed from 1989 to 1998 but by the year 2000 equal numbers of men and women earned S&E degrees in the United States.

FIGURE 2 ABOUT HERE

The bottom panel of figure 2 displays the total number of doctoral degrees award to men and women in S&E and non-S&E fields over the same time period. In 1989, men and women earned the same number of doctoral degrees in non-S&E fields, but women's completion of doctoral degrees increased rapidly over time such that by 2008, 15,429 women earned non-S&E doctoral degrees, compared to 8,894 earned by men. The pattern for S&E doctoral degrees is quite different. Men's S&E doctoral degree receipt has remained steady, at approximately 10,000 per year from 1989 to 2008 (with a notable decline from 2001 to 2006 when doctoral degrees received by men dipped below10,000 per year). Meanwhile, women's receipt of S&E doctoral degrees has doubled over time, from 4,960 per year in 1989 to 9,476 in 2008. While women have not yet reached parity with men in their receipt of S&E doctoral degrees, if the trend line continues at the same trajectory, women and men should be at parity in science and engineering doctoral degrees in the coming years.

Career-Family Tradeoffs for Women in Professional Occupations

Explanations of gender differences in occupations have tended to focus either on the personal choices of individual women and men (Gilligan 1982) or on institutional discrimination and structural arrangements of careers (Kanter 1977; Reskin and Roos 1990). A third perspective, one which informs our analysis here, focuses on broader social and cultural changes in education, work and family life which in turn have led to different opportunity structures for women in the world of work than those that existed just a few decades ago (Goldin 1990; Goldin and Katz 2002). Due to the women's movement and the cultural and legal changes it wrought, today women have more educational and professional opportunities than at any point in history. This perspective acknowledges that as women's labor force participation has increased substantially and they have made inroads into previously male-dominated occupations, the organization of family life has changed less significantly over the same time period (Percheski 2008). Thus women who have entered demanding professional occupations experience "competing devotions" (Blair-Loy 2003) to their careers and their families, both of which are "greedy institutions" (Coser 1974). This is especially true for women in the United States, where there is no publicly provided childcare and no national policy of paid parental leave (Percheski 2008; Gornick and Meyers 2003). Strategies for balancing the demands of career and family may include opting for one or the other (e.g., having no or fewer children or working less or not at all) or, for women in high-paying professions, outsourcing childcare.

One fruitful way to examine career-family tradeoffs is to compare the income and employment patterns for women with different family situations. Some recent research has examined the child penalty for different cohorts of college-educated women (Goldin 2006) or women in professional occupations (Percheski 2008). These studies find relatively small employment differences between mothers and childless women for the youngest cohorts of women. Percheski (2008) finds rising full-time, year round employment rates across cohorts, even among women in historically male professions and mothers of young children. She also finds that the child penalty (measured as differences in employment rates between mothers and childless women) is shrinking across cohorts (see also Boushey 2005). Note that while such comparisons offer clues about career-family tradeoffs, they do not reveal the actual mechanisms behind these relationships, as they cannot speak to differential selection into marriage or motherhood nor do they consider intrinsic values that may lead individuals to prefer one career over another.

The current study examines career family tradeoffs across highly-educated women in elite occupations in order to determine whether the tradeoffs are higher in some professions than others. Then it examines the degree to which differential tradeoffs align with the popularity of different careers for women as measured by variations in women's representation in these fields.

Data and Methods

We analyze trends in highly-educated women's occupations, incomes, and family formation patterns using decennial census data from 1980 to 2000 from the Integrated Public Use Microdata Series (IPUMS) (5% samples) and the 2009 American Community Survey (ACS). We restrict the sample to women aged 30-44 because we want to understand the extent to which family formation rates and career-family compatibility differ across occupational groups. By the ages of 30 to 44, women have most likely completed their education and their career and family formation trajectories are established (Hertz 2004). We further restrict the sample to highly-educated women currently employed in elite or professional occupations, since we are interested in the relationships between women's family decisions and earnings in such professions.

The Census' occupational classification scheme for 1990 offers a consistent, long-term classification of occupations comparable from 1980 to 2009. The occupational scheme contains 389 categories that can be aggregated into broader occupational categories.[2] From this, we created a nine category occupational code representing only professional and managerial occupations. The categories are split into science-related and non-science related professions. Science-related professions include: 1) math and physical scientists, 2) engineers and computer scientists 3) life scientists, 4) medical doctors, and 5) health professionals. Non-science related professions include: 6) lawyers and judges, 7) business, including managerial and management-related occupations,[3] 8)

[2] These occupational categories include managerial and professional; technical, sales and administrative; service; farming, forestry, and fishing; precision, production, craft, and repairers; operatives and laborers; and non-occupational responses.

[3] Managerial and management-related professions both fall under the broader umbrella of business professions but are separated because managerial represent higher-level business professions, including chief executives, legislatures, managers and administrators, while management-related professions include

teachers, including primary, secondary and tertiary education,[4] and 9) other professional occupations, including social scientists, clergy, and librarians. Appendix 1 presents further detail on each occupational category and Appendix 2 presents sample sizes for each occupational category by age group.

We examine trends over time in occupations for women. Then we investigate differences in marriage, family formation and earnings for women across professional occupations in order to understand the relationship between women's career choices, earnings, and family statuses. Using information from women's current marital status and age of her children, we create a measure that includes five categories of current family status; women who are 1) single with no children, 2) single with children, 3) married with no children, 4) married with children under the age of five and 5) married with children aged 5 or older.[5] This measure captures the complexity of American families because it includes all children living in the household – biological children, step-children and adopted children. We divide married women with children into two categories; those with children under the age of 5 and those with children aged 5 or older in order to determine if there are differences in women's occupational and income status based on the presence of young children in the household. Women with younger children are more likely to experience work-family conflict because young child require a great deal more care and expense if they are in childcare versus school for the majority of the workday. It is important to note that this measure does not include children not currently living in the

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accountants, insurance underwriters, human resource personnel, analysts and other management support occupations.

[4] The income levels and family status rates of primary and secondary versus post-secondary teachers were similar, so we combined them into one category. We include all teachers in one category because we are unable to distinguish between science and non-science teachers, or college/university professors and other post-secondary teachers.

[5] Single women with children include women who have never married and divorced women with children. We are unable to separate the categories due to small sample sizes.

household. Since the sample comprises highly-educated, professional women, few of them are likely to have had children so young that those children are old enough to be living on their own. While we would like to compare this measure to a woman's total fertility or the number of children ever born to her, these variables are not available in the census data.

Income is measured as the individual's total pre-tax wage and salary income for the past 12 months and includes wages, salaries, commissions, cash bonuses, tips and other money income received from an employer. Payments-in-kind or reimbursements for business expenses are not included. Amounts are expressed in constant 1999 dollars.

Descriptive Findings

Because the goal of this paper is to examine career-family trade-offs for highly-educated professional women, it is important to understand how the women examined in this study compare to all women (presented in Appendix 3). In 1980, 61% of women aged 30-44 were employed in the United States. Of these women, 27% worked in professional occupations. By 2009, 70% of women were employed and 42% worked in professional occupations. However, among women with a bachelor's degree or higher, 72% of women were employed in 1980, and 74% were employed in professional occupations. In 2009, 79% of women with higher education were employed, and 73% were employed in professional occupations. These statistics underscore that the population of highly-educated, women working in professional occupations analyzed here constitutes a small sample of all American women. In sum, the 1980 sample constitutes 9% of all women aged 30-44 in the United States, and the 2009 sample constitutes 21% of all women.

We examine trends over time among highly-educated women working in professional careers (see Figure 3). One of the most striking changes in occupations from 1980 to 2009 is the exodus of women out of teaching and into other occupations. In 1980, almost 57% of women working in professional occupations were teachers, compared to 32% in 2009. Of course, teaching is still the one of the most common occupations for professional women, but over time, women have moved into other occupations. In 1980, the second most common occupation for women was business, but by 2009, business surpassed teaching to become the most common occupation, comprising 33% of working professional women. In addition to teaching and business, professional health occupations (excluding medical doctors) comprise one of the largest shares of professional working women (14%), and this occupation has remained relatively popular over time, comprising between 11 and 15% of working, professional women over the past four decades.

FIGURE 3 ABOUT HERE

After the business and health fields, the largest increases of professional women have been in engineering and computer sciences, medicine and law. Only 1.4% of professional women were working in engineering and computer science in 1980, compared to 4.3% percent in 2009. The percentage of women working as medical doctors increased over this time period, from 1.3% in 1980 to 3.3% in 2009. The percentage of women working in law experienced a similar rate of growth, increasing from 2.1% in 1980 to over 3.6% in 2009. Women increased their participation in life sciences from 0.6% in 1980 to 1.1% in 2009. While these changes may appear small, it is clear that over time women have moved into occupations in the sciences as well as law, and these shifts have occurred mainly at the expense of teaching.

Among women working within the science professions, the largest number work in the health professions. This is not surprising given that this category includes registered nurses, a predominately female field. After health professionals, women are most likely to work in engineering and computer sciences, followed by medicine, and math and physical sciences. The smallest percentage of women works in the life sciences. It may be surprising that fewer women are working in the life sciences given that women are far more likely to major in biology and other life sciences in college than physical science or engineering (Turner and Bowen 1999; Sonnert et al. 2007). However, life science majors may enter other high-status professions, including medicine and other health professions or teaching at the K-12 or post-secondary level.[6]

Next, we examine trends in income for women within each occupation over time. Figure 4 presents average income by professional occupation for working women aged 30 to 44 with a bachelor's degree and with an advanced degree. For women with a bachelor's degree only, income information is not available women working in medicine or law because these occupations require an advanced degree. In 1980, among women with a bachelor's degree only, women working in engineering and computer science earned the highest income ($43,608), followed by women in the math and physical sciences ($38,986), and women working in life science or business (approximately $35,000 a year in each profession). By 2009, women in business earned the highest

[6] Ideally we would separate K-12 and post-secondary teachers by the subject they teach in order to identify women teaching science, but the data do not permit this distinction.

average income ($59,774) surpassing women in engineering and the science professions. Women working in health professions earn more than women working in life sciences in 2009 ($43,420 compared to $41,318). Over the previous four decades, women's incomes in business and the health professions grew the most dramatically, approximately $15,000 in each profession. In contrast, women working as teachers earned the lowest income at $26,368, and on average, teachers' incomes have experienced the least amount of growth (less than $3,000 a year) over four decades.

Among women with advanced degrees, women working in medicine and law earned the highest incomes in 2009 ($78,760 and $69,437, respectively). Over time, lawyers, doctors and women in business have experienced the greatest increase in income among women with advanced degrees. Lawyers incomes have increased by approximately $29,000, followed by a $21,000 increase for businesswomen and $18,000 increase for doctors. Teachers and other professionals have experienced little income growth over time, while women in health professions, engineering and computer science, and math and physical sciences experienced moderate growth in income. Women in the life sciences experienced the smallest amount of income growth of the science professions ($10,000). Currently, while doctors and lawyers earn the highest income, teachers and other professionals earn the lowest average income, even when they have an advanced degree. Women working in business with advanced degrees earn more than women working in any science field with the exception of doctors. These findings suggest that there are greater returns to higher education in the elite fields of medicine and the law than in other professions. Also, for women with a bachelors or advanced degree, working in the business field is more lucrative than working in math, physical or life sciences, and slightly more lucrative than engineering or computer sciences.

Next, we consider whether women within occupations are more or less likely to be married or have children. Figure 5 presents the percentage of women within each occupation that is married and that has children for women with a bachelor's degree and women with an advanced degree. First, we focus on current patterns of marriage and fertility in the year 2009. For women with a bachelor's degree and an advanced degree, women in education and the health professions include the highest percentages of women who are married and who have children. Only doctors have higher percentages of being married (73% versus 71% for both health and education). Yet, doctors do not have equally high rates of having children (60% versus 64 and 66% for health and education, respectively). Comparing women in science with advanced degrees, women in the life sciences are less likely to be married or have children than women in math and physical science or engineering and computer science. Again, women in medicine stand out among sciences and other elite professions. They are more likely to be married or have children than any other science or elite occupation, rivaling the percentages of women married or having children in health and education. Women in law and business - elite, non-science professions - look more like women in science than medicine, health or education, with lower proportions of women being married or having children.

FIGURE 5 ABOUT HERE

In sum, descriptive statistics show that women working in the sciences are not alike. There are clear income divisions between women working in math and physical engineering, physical and life science, medicine and in the health professions. Women working as health professionals and teachers earn the lowest incomes and have the highest rates of marriages as well as are the most likely to have children. Women in medicine have similarly high rates of marriage and childbearing; yet have the highest average income of any occupation. Women in life sciences differ from women in other science careers in that they have the highest rates of childlessness combined with relatively low incomes. Women working in math, physical sciences, and engineering and computer sciences fair slightly better in comparison to the life sciences in terms of income, getting married and having children. It is also interesting that women working in business and law earn higher incomes and are more likely to be married and have children than women in math, engineering, physical or life sciences. The descriptive statistics suggest that there may be greater incentives for highly-educated professional women to enter into medicine, law or business in terms of higher incomes as well as greater likelihoods of marrying and having children compared to women in other science professions. Next, we examine specific trade-offs for women entering into science or non-science professions including, child penalties in work hours and wages.

The Child Penalty Among Elite Occupations

Table 1 presents employment and income ratios for women with young children (under the age of 5) compared to women without children. These calculations are often referred to the "child penalty" for having children.[7] First, we examine employment ratios, or the average hours women with young children work per week compared to the

[7] There are different strategies for calculating the child penalty for working hours and income (for example, see Percheski 2008; Waldfogel et al. 1998). We utilize a strategy that compares the number of hours worked or income of women with young children divided by number of hours worked or income of women without children.

hours worked by women without children. Across all professional occupations and time periods, women with young children work less than women without children. However, the size of this gap varies across time and across occupations, which is consistent with findings from other research (Percheski 2008). Within occupations, the ratio of working hours remained stable over time for most occupations. For example, in the life sciences, women with young children worked 9% fewer hours than women without children in 1980, compared to 10% fewer hours in 2009. In a few occupations, mothers have decreased the gap in working hours with non-mothers over time. In health professions, law, business and education, women with young children became more like women without children in the hours they worked per week. Women with young children decreased the gap the most in health professions: working 25% fewer hours in 1980 compared to 18% fewer hours in 2009.

TABLE 1 ABOUT HERE

Across occupations, women with young children receive less of an employment penalty (i.e. work comparable hours to women without children) in math and physical sciences, engineering and computer sciences, life science, business and education. In each of these occupations women with young children work around 10% fewer hours than women without children. Of course, it is unclear from these descriptive findings whether this is due to the fact that there is less of a penalty for having young children in these occupations or if women are unable to reduce their work hours in order to accommodate having young children. It is also possible that women in higher paying occupations are able to afford quality childcare for young children and not disrupt their work as much. The professions with the largest discrepancies in the hours worked for women with young children compared to women without children include medicine, law, health professions and other professions. In 2009, women with young children in medicine have the largest gap in working hours than any occupation, with the exception of the "other" category. Women with young children medicine work 19% fewer hours compared to women without young children. Women in law work 14% fewer hours. Of course, it should be noted that women in medicine and law work, on average, the longest hours of all occupations (46 and 43 hours a week, on average). Additionally, 42% of women in medicine and 33% of women in law work more than 50 hours a week, on average (other occupations range from 8-25% of women working 50 or more hours a week). In sum, doctors and lawyers experience the largest child penalty in terms of working hours yet they work the more hours on average, than other occupations.

Women with young children work less than women without children in all occupations, but do they earn less money? Table 1 also presents income ratios (or wage gaps) for women with young children compared to women without children. We first compare all women, then women working full-time (35-49 hours a week) and women working 50 or more hours a week. Across occupations, there is not a clear wage penalty for having children and if a penalty ever existed, it decreased over time for all occupations. For example, women with young children in health professions earned 44% less than women without children in 1980. By 2009, they earned 16% less. In business, women with young children in 1980 earned 19% less than women without children, but now are at parity. In the life sciences, medicine, and law, women with young children earn more than women without children. In medicine, women with young children earn

9% more. In life sciences, women earn 14% more. Currently, there is not a wage penalty for having children in elite occupations, even though women are working fewer hours.

To further disentangle how working hours may affect the child wage penalty, we compare income ratios for women working full-time and women working more than 50 hours a week. Among women working full-time, women with young children either earn the same amount as women without children in 2009 or more in every occupation. The gap is the largest in medicine, where women with young children earn 23% more than women without children. Examining occupations over time suggests that women never experienced a wage penalty for having children in medicine or law when they worked similar hours (women earned 26% more in medicine and 6% more in law in 1980). In other occupations, women experienced wage penalties in earlier time periods but they have disappeared or reversed by 2009. In comparing women who worked more than 50 hours a week, a similar pattern emerged (where large enough sample sizes existed to compare women), with the exception that women in health professions and education experienced a wage penalty for having children in 2009.

The findings in Table 1 suggest that when women work a similar number of hours, a wage penalty for having children does not exist in most elite, professional occupation. One might assume that these gaps are due to different ages of women with children. That is, women with young children in professional occupations may be older because they have delayed childbearing, and therefore have more experience and earn higher incomes. This is not the case. We examined income ratios for different age groups of women (results available from authors upon request) - from 30-34, 35-39 and

40-44 - and women with young children earned more than women without children in every age group. Next, we examine these trends in a multivariate analysis.

Table 2 presents the OLS regression of logged income on family status, education, age, working hours, and year for each occupation. For all occupations, women with advanced degrees, older women, and women who work more hours earn higher incomes. Also, over time, for most occupations, women earn significantly higher incomes. The effect of family status on logged income varies by occupation. For most occupations, being unmarried with children decreases income compared to being single without children. Married women without children do not have significantly different incomes from single women in the majority of occupations, but do earn more than single women in law and business and earn less in education. Similar to the findings in Table 1, being married with young children is associated with higher earnings than being single without children in math and physical science, engineering and computer sciences, life sciences, medicine, law, and business. Only in the health professions and education do women with young children earn less than single women without children. Being married with older children does not significantly affect logged income in the sciences. Among women in medicine, being married and having older children is associated with significantly higher earnings than single women without children. The reverse is true among health professions, business, education, and other professions. In these occupations, being married with older children is associated with lower earnings. These findings demonstrate that even when controlling for education, age, and work hours, women with young children earn more in most elite occupations than women without children. The exceptions are health professions and education. Women working in elite science occupations, medicine, law or business do not appear to experience a wage penalty for having young children, yet women in health and education occupations do. Furthermore, having older children is associated with higher wages for women in medicine but lower wages in health professions, business and education.

TABLE 2 ABOUT HERE

We also ran regressions with a different reference category for family status - married with young children - and with a dummy variable for whether women had children or not (regardless of marital status; results available upon request from authors). The story remains largely the same. When comparing women with children to women without children, there is no different in income for women in math and physical science or life science. Women with children earn more than women without children in life science, medicine and law. Childless women earn significantly more in health professions, education, business and other professions. When comparing different family statuses to women with young children, across all occupations with the exception of health professions, women with older children earn less than women with young children. Combined with the fact that women with young children earn more than their childless counterparts, this suggests that controlling for age and works hours, there is not a child wage penalty for women with young children. However, having older children may cause wages to decrease over time - suggesting a long-term penalty for having children.

Decomposing Income Inequality Across Family Status

Our results thus far suggest there are not significant wage penalties in elite science careers, medicine or law. Instead, women in these occupations earn more than women in other occupations regardless of family status. Next, we decompose income inequalities by family status for each occupation. To do this, we use the Theil index, a generalized entropy index of inequality.[8] The Theil index has the property that overall inequality can be decomposed into a component that is between groups and a component that is within groups (Bourguignon, 1979; Cowell, 1980). The Theil index can be written:

$$T = \overbrace{\sum_{k=1}^{K} \phi_k \frac{\bar{x}_k}{\bar{X}} ln\left(\frac{\bar{x}_k}{\bar{X}}\right)}^{between\,group\,inequality} + \overbrace{\sum_{k=1}^{K} \phi_k \frac{\bar{x}_k}{\bar{X}} T_k}^{within\,group\,inequality}$$

where k indexes groups, x_k is the within group mean, X is the grand mean, φk is the proportion of the population in group k, and T_k is the Theil index for group k. The extent to which within-occupation inequality in earnings for women incumbents exists across family types becomes a measure of the extent of tradeoff between career and family that exists for that occupation's female incumbents.[9] We computed generalized entropy indices of inequality and decomposed them into within and between-family-group components. The proportion of inequality that is between-group is a measure of tradeoffs between family and earnings made by women in each of these occupational groups.

Table 3 presents the Theil inequality index for total inequality, within-and between-subgroup decomposition of inequality for each occupation in 1980 and 2009, then it shows the measure of inequality for each subgroup. This decomposition is limited to

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[8] The Theil index is one of many generalized entropy indices of inequality, including the Atkinson index, the square of the coefficient of variation and Gini index.

[9] Our approach can usefully be compared with alternatives such as the modeling strategy used by Waldfogel and colleagues in estimating the wage penalties of motherhood (Waldfogel, 1998a,b). Standard decomposition methods would be problematic because the need to take account of the now well-known tendency for between- group differences to depend upon the overall level of inequality, which includes the within-group as well as the between-group component (Blau and Kahn, 2000). For the sake of space, we present only the Theil index, but alternative indices of inequality were calculated to determine the extent of sensitivity of the results to the particular measure of inequality that is used e.g., Gini vs. Atkinson vs. Theil vs. a full-distribution approach to the decomposition (Jenkins and Kerm, 2005). These results are available upon request.

women working full-time with an advanced degree. First, we focus on total inequality. The highest levels of income inequality exist in medicine (.165 in 2009), followed by law (.145), and business (.116). The least inequality exists in education (.66) and engineering and computer science (.70). Over time, income inequality declined in most occupations, including: engineering and computer science, life science, medicine, business, education and other professions. Income inequality increased in math and physical science, health professions and law. The largest declines in income inequality occurred in the life sciences and engineering and computer science (-25% in each occupation), followed by medicine (-14%).[10] The largest increase in inequality occurred in the health professions (25%), followed by math and physical science (8%).

TABLE 3 ABOUT HERE

Across all occupations, within-family status inequality is larger than the between-family status inequality. More inequality exists within family status groups than it does across family status groups. Inequality that is due to differences in the average income in different family statuses is extremely small. In all occupations, income differences by family status contribute 5% of less to total income inequality.[11] Family status contributes the most in medicine (5%), math and physical science (3%) and life science (3%). This table suggests that while there are not large differences in income for women of different family statuses, women in medicine, law and business experience the most inequality due to family status. With that said, these are also the occupations with the highest average incomes overall.

Table 4 presents the Theil inequality index for total inequality, within-and between-

[10] Calculated as (2009 index - 1980 index) / 1980 index * 100
[11] Calculated as between group inequality/total inequality * 100

subgroup decomposition of inequality for each family status as well as shows the measures of inequality computed in each subgroup. Unlike income inequalities between family status, which largely decreased over time, income inequality between occupations increased over time for all family status groups. Given the diverging incomes presented in Figure 4 for women with an advanced degree, rising income inequality between occupations in not surprising. However, it has risen at different rates across family statuses. Among women with young children, income inequality increased the smallest amount: from .122 in 1980 to .145 in 2009, an increase of 19%. Income inequality increased the most for married women without children (48%), and unmarried women with children (42%). Inequality rose by 34% for single women without children and 33% for women with older children.

The largest amount of total income inequality across occupations exists for married women with young children (.145), followed by unmarried women with children (.140) married women with older children (.139) in 2009. Women without children experience less income inequality across occupations (.133). Across family statuses, between-occupation inequality accounts for less of the total income inequality than within-occupation. Between-occupation inequality accounts for between 17-30% of income inequality across family statuses (substantially more than between-family status inequality in Table 3). Between-occupation inequality accounts for the smallest amount of income inequality for single women without children (17%) and married women without children (20%). For women with children, between-occupation inequality accounts for close to 30% of income inequality (29% for married women with young children and unmarried women with children and 30% for married women with older children). This suggests that the income inequalities across occupations are due more to the divide between women with children than women without children than marital status. For women without children there are fewer wage trade-offs for choosing an occupation than exist for women with children.

Table 5 presents replicates the models presented in the OLS regressions in Table 2 and decomposes within-group income inequality for each occupation (the top panel) and each family status (the bottom panel). The regression-based decomposition assesses the contribution of each independent variable to inequality, which is presented as the percentage it contributes to inequality. This allows us to assess whether one variable contributes uniformly to inequality in each family status or has a disproportionate effect across the family statuses. As we saw in the decomposition in Table 3, family status explains a small percentage of income inequality across all occupations, and it's contribution to inequality has decreased over time. For example, in the life sciences, family status explained 1.32% of income inequality in 1980, and only 0.04% in 2009. Focusing on inequalities in 2009, family status contributes less than 1% of income inequality in all occupations, compared to the much larger contributions of working hours (between 12 and 38%) and age (between 1 and 5%). When examining how much each subgroup of family status contributes to inequality, the percentages vary across occupations. For example, being married with young children increases inequality in the life sciences by 0.38% but decreases inequality in math and physical science by 0.21%. However, these contributions of small, and underscore our point that across occupations, family status does not have a powerful influence on income inequality. This suggests that there are not large trade-offs for having a family in science occupations compared to other professional occupations.

TABLE 5 HERE

The bottom panel of Table 5 presents the regression-based decomposition of income inequality by family status. This allows us to see how much occupations contribute to income inequality for women in each family status. In 2009, occupations explained a greater percentage of income inequality (between 9-12%) than in 1980 (between 1-3%). Across family status, education contributes to the most to income inequality, from a low of 5.3% among single women without children to a high of 8.7% among married women with older children. Science occupations explain far less income inequality (less than 1% each), suggesting that there are not large income trade-offs for women in terms of science occupations, regardless of which family status they enter.

CONCLUSION & NEXT STEPS

In this paper, we consider how family status and occupation affects income inequalities among highly-educated working women in professional occupations. We find that while women have entered into science professions at greater rates over time, largely at the expense of teaching, their participation is still quite low. Across professional occupations women in the sciences, medicine, law and business appear more alike than different in terms of income as well as marriage and fertility rates. However, women in medicine have a clear advantage in terms of higher incomes, lower wage penalties (or even advantages) for having children and higher rates of marriage compared to other elite occupations. In contrast, women in health professions and education - the only historically female-dominated fields examined - continue to earn far less money and are penalized for having children compared to their educated, professional female counterparts.

We find a child penalty in terms of working hours for all women (one that is declining over time, as discussed by Percheski (2008)), but we do not find that women with young children earn less money than their childless counterparts. Even when examining women working the same number of hours, women with young children earn the same amount or even more (in medicine, life sciences and the law) than women without children. We also demonstrate the income inequalities within occupations are not largely due to differences in family statuses among women. Across occupations, women only experience penalties for having children in education, health, and business (but only if women in business had children at earlier ages). Women in medicine and law work the longest hours of any occupations, and are well compensated for those hours. Therefore women in these occupations likely able to afford quality childcare and maintain long working hours. Of course, high-status occupations like medicine or law may not provide women with family-friendly work environments that allow women to reduce their working hours or work flexible schedules, and research has discussed the challenges and work-family conflicts women face in these occupations (Blair-Loy 2003).

To answer the question of why women do not enter into science at higher numbers, it is important to consider the alternative career paths for highly-educated women. In considering the family and patterns of women in different science and non-science occupations, we find that within science fields, women in medicine earn far more money than women in math, engineering, physical, life or computer science, yet also have high rates of marriage and fertility. Medicine may compete with other science occupations, and provides seemingly higher returns. It is also possible that the health professions and education may compete for science-minded women's attention. Health professions require a science background and women may enter teaching to teach science. While these occupations earn the lowest incomes, they are also more family friendly since they are historically female-dominated professions. One limitation of this paper (and the Census data) is that we cannot distinguish science teachers from other teachers, and therefore, cannot assess the number of women who enter education and teach science versus work in applied science occupations. Finally, law and business are lucrative alternatives to science careers for women, yet provide similar trade-offs in terms of family life.

Many competing arguments exist for why women do not enter science, from a "chilly climate" to different job-specific preferences and values (Blickenstaff 2005; Hakim 2000). In this paper, we cannot reveal the specific mechanisms behind trade-offs in career and family, as we cannot speak to differential selection into marriage or motherhood or consider intrinsic values that may lead individuals to prefer one career over another. But this paper suggests that barriers to women entering science do not include drastically different family trade-offs compared to other occupations. It is plausible that higher incomes in medicine, law or business may attract women, or the family-friendly (but not financially lucrative) health professions or education may also attract women.

The next steps of this project are to more thoroughly investigate how family status contributes to income inequality within only the elite science occupations of math and physical science, engineering and computer science, and life science, and then within only elite occupations (all occupations excluding education, health professions and other professions). By focusing on only science occupations, we will be able to determine if any career-family trade-offs exists within science occupations that may cause women to choose one over the other. Then, by excluding education and health professions, we can focus more clearly on how law, business and, especially, medicine may be more attractive to women.

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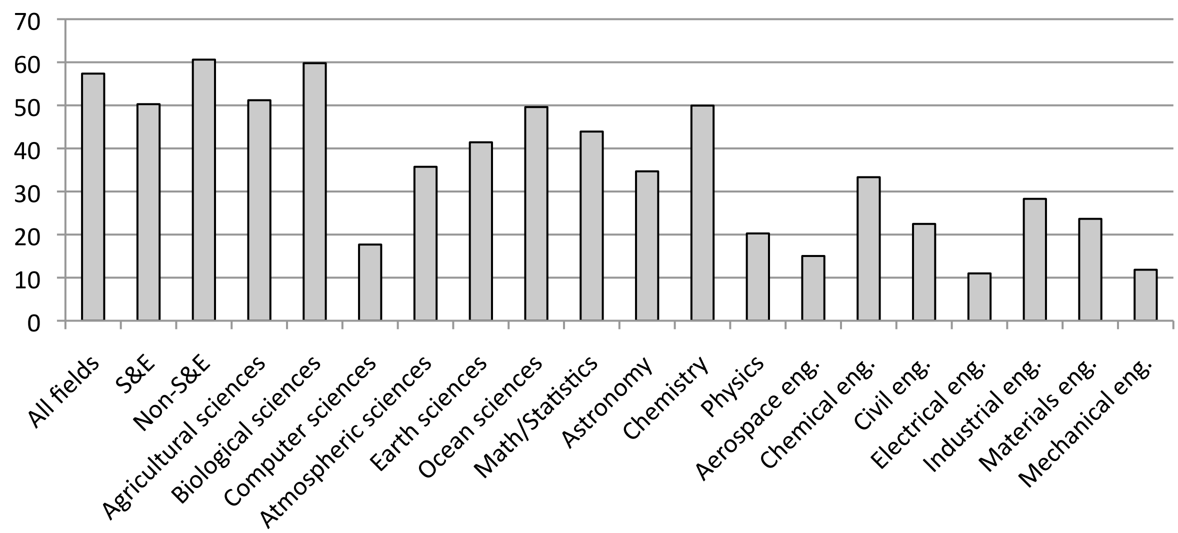
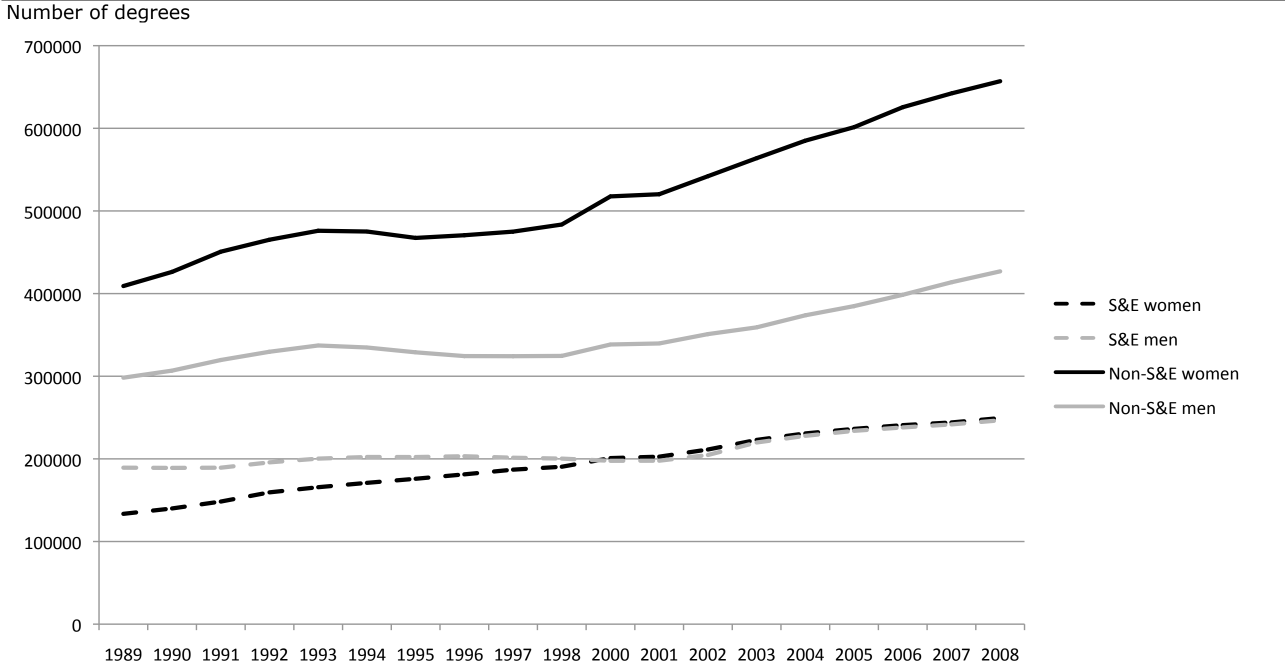
Figure 1: Women as a Percentage of All Students in Various Science & Engineering Bachelor's Degrees, 2008



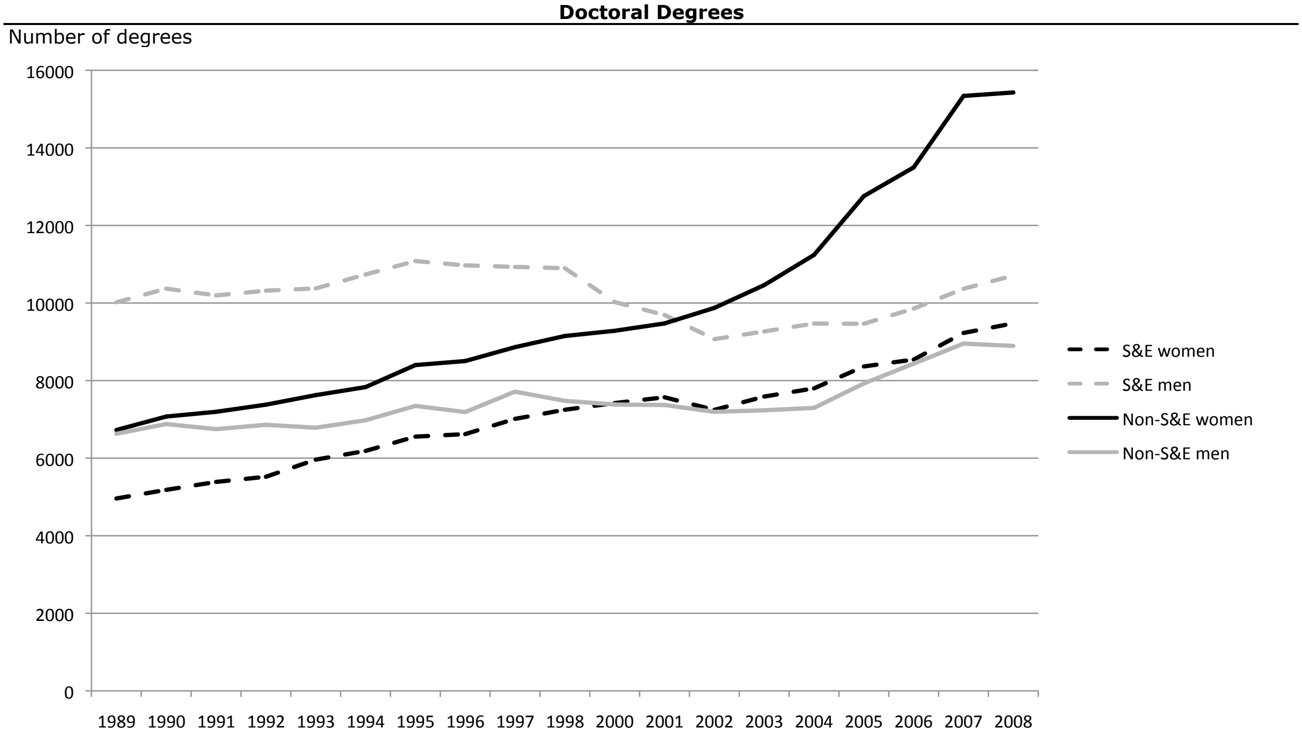
SOURCE: National Science Foundation, Division of Science Resources Statistics, special tabulations of U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey.

Figure 2: Trends in Bachelor's and Doctoral Degrees Awarded in Science and Non-Science Fields, by Gender, 1989-2008

Bachelor's Degrees



Doctoral Degrees

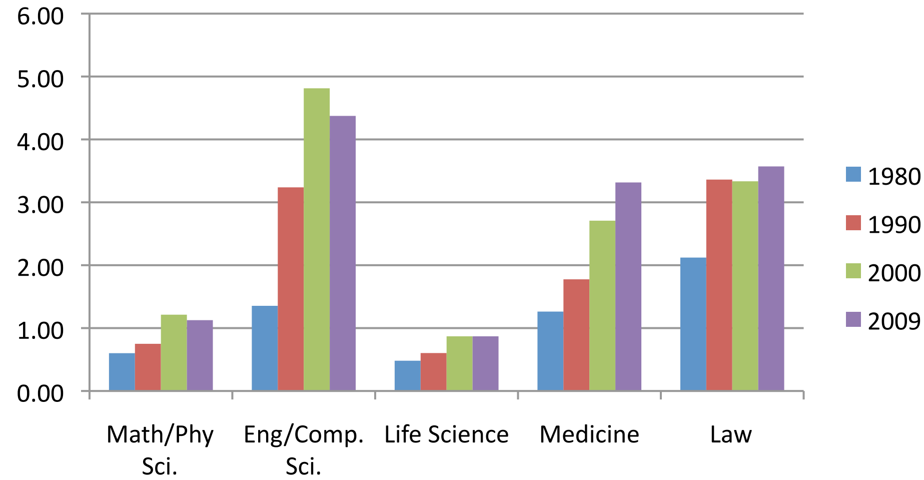


NOTES: Data not available for 1999. Dpctoral degree data in this table differ from doctoral degree data in this report that are based on NSF Survey of Earned Doctorates (SED). SED data are for research doctorates only. Greatest differences are in psychology, education, and medical/other health sciences. Bachelor degree data based on degree-granting institutions eligible to participate in Title IV federal financial aid programs and do not match data published before 2009 that were based on accredited higher education institutions.

SOURCE: National Science Foundation, Division of Science Resources Statistics, special tabulations of U.S. Department of Education, National Center for Education Statistics, Integrated Postsecondary Education Data System, Completions Survey, 1989–2008.

Figure 3: Percentage of Women Aged 30-44 with a Bachelor's Degree or Higher Employed in Professional Occupations

Occupations in which less than 5% of working women work



Occupations in which more than 5% of working women work

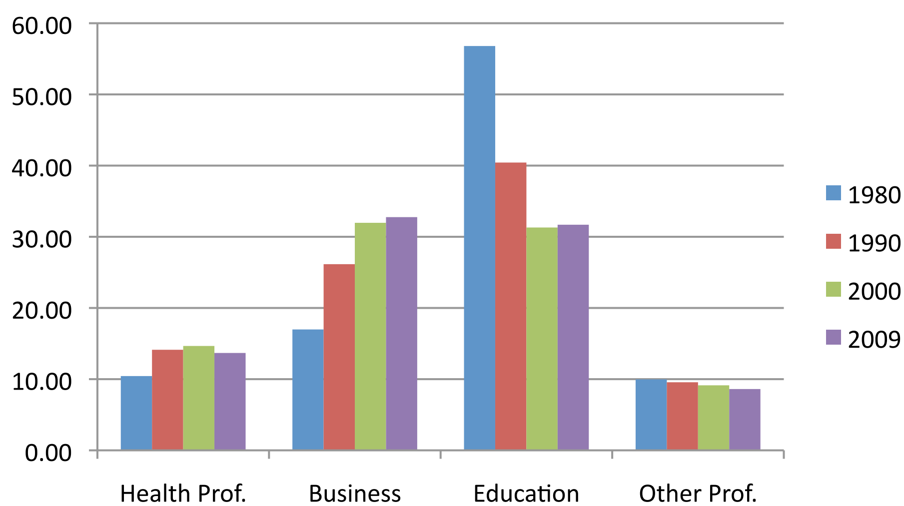
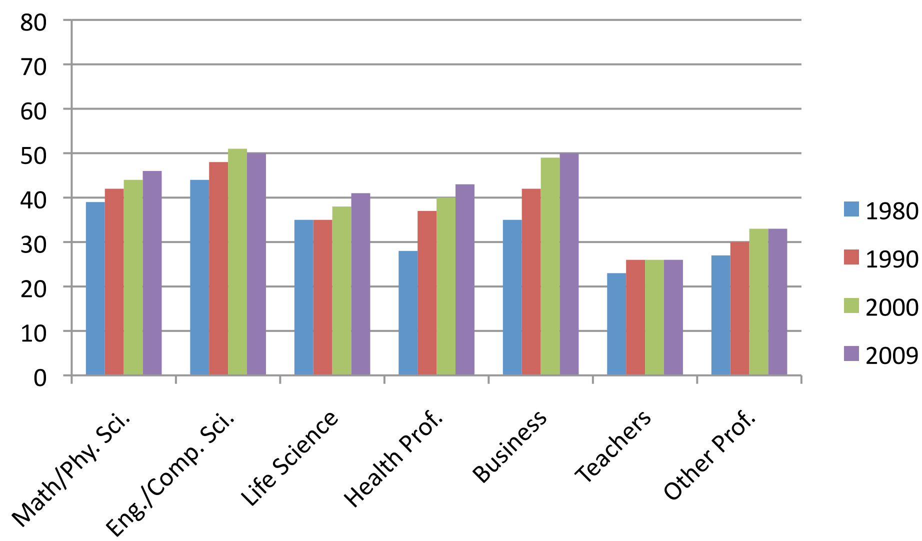
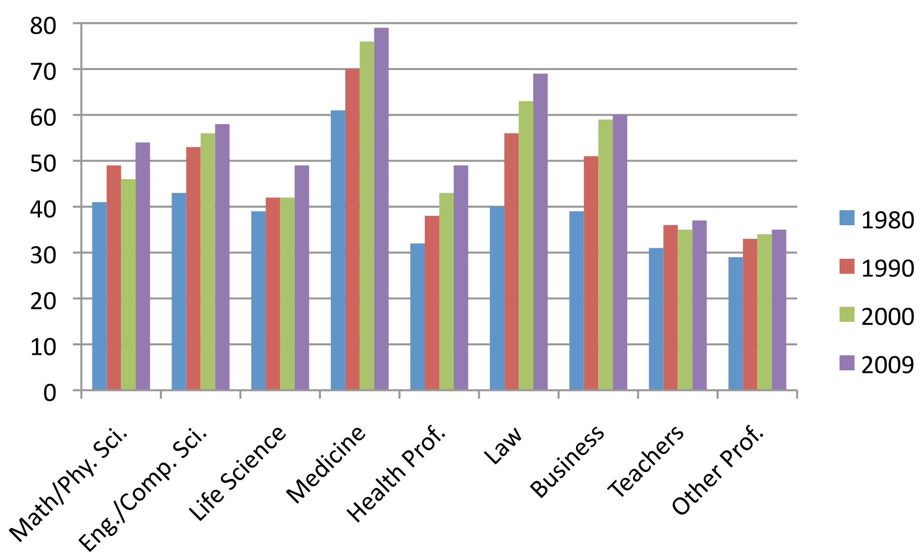


Figure 4: Trends in Income for Working Women Aged 30-44 by Education Level

With a Bachelor's Degree



With an Advanced Degree

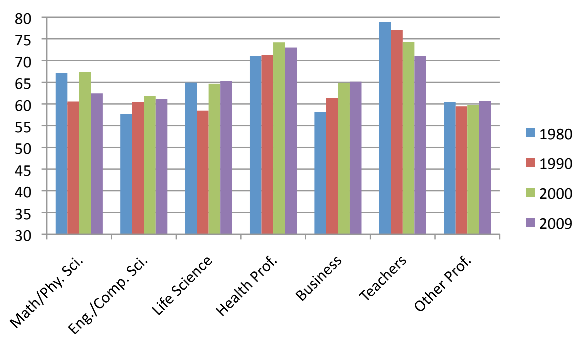


Source: 1980-2000 IPUMS, 2009 ACS
Note: Average income (in constant 1999 dollars) rounded to the nearest thousand

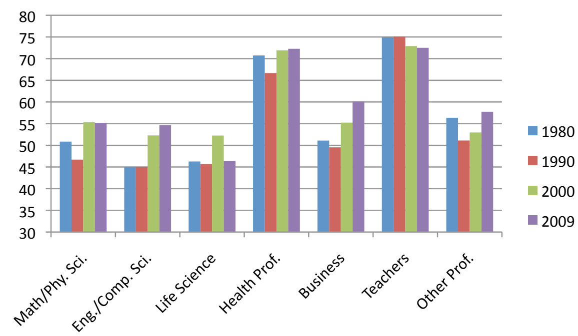
Figure 5: Percentage of Employed Women Aged 30-44 who are Married and who Have Children, by Occupation and Education Level, 1980-2009

With a Bachelor's Degree

Percentage of Women who are Married

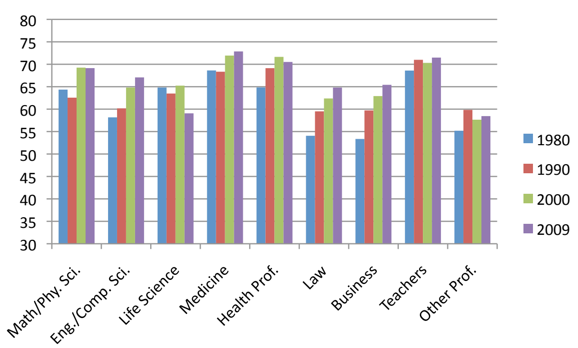


Percentage of Women who Have Children

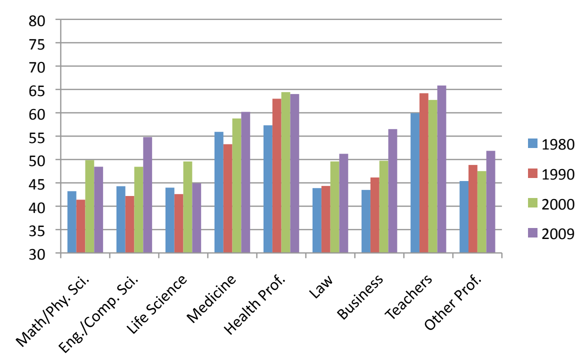


With an Advanced Degree

Percentage of Women who are Married



Percentage of Women who Have Children



Source: 1980-2000 IPUMS, 2009 ACS

Table 1: Employment and Income Ratios for Women with Young Children v. Childless Women, By Occupation

	Employment (Hours per Week) Ratio				Income Ratio				Income Ratio for Women Working 35-49 Hours a Week				Income Ratio for Women Working 50 or More Hours a Week			
	1980	**1990**	**2000**	**2009**	**1980**	**1990**	**2000**	**2009**	**1980**	**1990**	**2000**	**2009**	**1980**	**1990**	**2000**	**2009**
Math/Physical Science	0.90	0.92	0.90	0.89	0.83	0.94	1.06	0.95	0.89	0.99	1.08	1.02	n.a.	n.a.	1.20	n.a.
Engineer/Computer Science	0.91	0.90	0.90	0.91	0.89	0.94	0.98	1.01	0.98	1.00	1.06	1.08	n.a.	1.07	1.05	1.09
Life Science	0.91	0.87	0.87	0.90	0.79	0.94	1.05	1.09	0.87	1.05	1.14	1.23	n.a.	n.a.	1.14	n.a.
Medicine	0.80	0.85	0.84	0.81	1.11	1.16	1.09	1.14	1.26	1.24	1.18	1.19	1.09	1.23	1.20	1.30
Health Professional	0.75	0.76	0.79	0.82	0.66	0.72	0.78	0.84	0.89	0.91	0.95	1.00	0.91	0.94	0.96	0.96
Law	0.83	0.84	0.84	0.86	0.91	0.94	1.00	1.07	1.06	1.09	1.17	1.16	n.a.	1.20	1.16	1.33
Business	0.89	0.87	0.86	0.90	0.81	0.88	0.95	1.00	0.91	1.02	1.08	1.11	0.91	1.03	1.11	1.08
Teachers	0.84	0.86	0.88	0.91	0.70	0.77	0.86	0.95	0.84	0.89	0.96	1.03	0.87	0.88	0.94	0.98
Other Professional	0.78	0.80	0.78	0.78	0.70	0.76	0.81	0.80	0.92	0.93	1.03	1.04	0.70	0.96	1.06	1.04

Source: 1980-2000 IPUMS, 2009 ACS

The income and employment ratios are calculated as follows: (R women with young children/R childless women)

Note: n.a. = not available because N<50

Table 2: OLS Regression of Logged Income on Family Status by Occupation

	Math/ Phys. Sci.	Eng. / Comp. Sci.	Life Sci.	Medicine	Health Prof.	Law	Business	Education	Other Prof.
Family Status (ref. Single, No Kids)									
Married, No Chlidren	0.03	0.00	0.05	0.01	0.00	0.06 **	0.03 ***	-0.02 ***	0.00
	(0.03)	(0.01)	(0.03)	(0.03)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Married with Young Children	0.08 **	0.06 ***	0.12 ***	0.20 ***	-0.10 ***	0.15 ***	0.07 ***	-0.01 ***	-0.08 ***
	(0.03)	(0.01)	(0.03)	(0.03)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Married with Older Children	0.00	0.01	-0.04	0.12 ***	-0.08 ***	0.04	-0.07 ***	-0.02 ***	-0.14 ***
	(0.03)	(0.02)	(0.05)	(0.03)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)
Unmarried with Children	-0.06	-0.06 **	0.06	0.08	-0.05 ***	0.00	-0.96 ***	-0.08 ***	-0.11 ***
	(0.04)	(0.02)	(0.06)	(0.05)	(0.01)	(0.03)	(0.01)	(0.01)	(0.02)
Graduate/Professional Degree	0.08 ***	0.10 ***	0.09 ***	---	0.04 ***	---	0.15 ***	0.32 ***	0.10 ***
	(0.02)	(0.01)	(0.03)	---	(0.01)	---	(0.01)	(0.00)	(0.01)
Age (ref. 30-34)									
Age 35-39	0.11 ***	0.11 ***	0.19 ***	0.27 ***	0.07 ***	0.11 ***	0.11 ***	0.09 ***	0.07 ***
	(0.03)	(0.01)	(0.03)	(0.03)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Age 40-44	0.25 ***	0.14 ***	0.32 ***	0.41 ***	0.10 ***	0.14 ***	0.18 ***	0.17 ***	0.11 ***
	(0.03)	(0.01)	(0.04)	(0.03)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Employment Status (ref. Part-time)									
Full-time (35-49 hours/week)	0.77 ***	0.89 ***	0.96 ***	0.64 ***	0.66 ***	0.89 ***	1.01 ***	1.16 ***	1.23 ***
	(0.05)	(0.03)	(0.07)	(0.04)	(0.01)	(0.03)	(0.01)	(0.01)	(0.02)
Full-time + (50+ hours/week)	0.86 ***	1.06 ***	1.03 ***	0.69 ***	0.79 ***	1.24 ***	1.29 ***	1.29 ***	1.34 ***
	(0.05)	(0.03)	(0.08)	(0.04)	(0.01)	(0.03)	(0.01)	(0.01)	(0.02)
Year (1980 ref.)									
1990	0.09 **	0.16 ***	0.02	0.10	0.26	0.25	0.18	0.08	0.10
	(0.03)	(0.02)	(0.04)	(0.03)	(0.01)	(0.02)	(0.01)	(0.00)	(0.01)
2000	0.05	0.16 ***	0.00	0.17	0.35	0.35	0.31	0.07	0.17
	(0.03)	(0.02)	(0.04)	(0.03)	(0.01)	(0.02)	(0.01)	(0.00)	(0.01)
2009	0.18 ***	0.18 ***	0.16 ***	0.24 ***	0.45 ***	0.44 ***	0.33 ***	0.09 ***	0.16 ***
	(0.04)	(0.02)	(0.05)	(0.03)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)
Intercept	9.63 ***	9.60 ***	9.31 ***	9.92 ***	9.62 ***	9.44 ***	9.24 ***	8.95 ***	9.95 ***
	(0.06)	(0.04)	(0.07)	(0.05)	(0.01)	(0.03)	(0.01)	(0.01)	(0.02)
Observations	5,203	20,125	3,931	12,186	75,160	17,400	151,682	212,471	51,461
R^2	0.184	0.209	0.248	0.128	0.252	0.242	0.264	0.368	0.33

*p<.05 **p<.01 ***p<.001

Source: 1980-2000 IPUMS, 2009 ACS

Table 3: Decomposition of Income Inequality by Family Status for each Occupation, 1980 and 2009

	Math/Physical Science		Engineer / Comp. Science		Life Science		Medicine		Health Professional	
	1980	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*
Total Inequality Index	0.094	0.101	0.094	0.070	0.133	0.099	0.192	0.165	0.079	0.099
Between Group Inequality	0.003	0.003	0.001	0.001	0.005	0.003	0.005	0.009	0.001	0.001
Within Group Inequality	0.091	0.098	0.094	0.069	0.127	0.096	0.187	0.156	0.078	0.098
Subgroup indices										
Single with No Children	0.090	0.111	0.100	0.073	0.074	0.102	0.200	0.179	0.073	0.098
Married with No Children	0.106	0.087	0.077	0.074	0.080	0.092	0.214	0.178	0.058	0.105
Married with Young Children	0.063	0.094	0.065	0.058	0.170	0.092	0.158	0.146	0.090	0.095
Married with Older Children	0.082	0.095	0.132	0.077	0.180	0.112	0.177	0.132	0.099	0.098
Unmarried with Children	0.106	0.099	0.088	0.069	0.400	0.042	0.230	0.149	0.071	0.097

	Law		Business		Education		Other	
	1980	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*
Total Inequality Index	0.143	0.145	0.118	0.116	0.073	0.066	0.102	0.100
Between Group Inequality	0.001	0.002	0.000	0.001	0.001	0.000	0.001	0.002
Within Group Inequality	0.142	0.143	0.117	0.115	0.071	0.066	0.101	0.099
Subgroup indices								
Single with No Children	0.136	0.134	0.116	0.119	0.070	0.072	0.106	0.104
Married with No Children	0.127	0.139	0.119	0.110	0.057	0.062	0.087	0.109
Married with Young Children	0.148	0.151	0.130	0.112	0.083	0.067	0.124	0.081
Married with Older Children	0.174	0.150	0.113	0.120	0.074	0.061	0.100	0.103
Unmarried with Children	0.142	0.142	0.113	0.112	0.077	0.063	0.089	0.091

Source: 1980-2000 IPUMS, 2009 ACS

Note: Presenting Theil index (GE(1)). For women working full-time, aged 30-44 with an advanced degree.

Table 4: Decomposition of Income Inequality by Occupation for Each Family Status, 1980 and 2009

	Single, No Children		Married, No Children		Married, Young Children		Married, Older Children		Unmarried, Children	
	1980	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*
Total Inequality Index	0.099	0.133	0.091	0.134	0.122	0.145	0.105	0.139	0.098	0.140
Between Group Inequality	0.006	0.023	0.008	0.027	0.022	0.041	0.014	0.041	0.005	0.041
Within Group Inequality	0.093	0.110	0.082	0.107	0.101	0.104	0.091	0.098	0.093	0.099
Subgroup indices										
Math/Physical Science	0.090	0.111	0.106	0.087	0.063	0.094	0.082	0.095	0.106	0.099
Engineer/Computer Science	0.100	0.073	0.077	0.074	0.065	0.058	0.132	0.077	0.088	0.069
Life Science	0.074	0.102	0.080	0.092	0.170	0.092	0.180	0.112	0.400	0.042
Medicine	0.200	0.179	0.214	0.178	0.158	0.146	0.177	0.132	0.230	0.149
Health Professional	0.073	0.098	0.058	0.105	0.090	0.095	0.099	0.098	0.071	0.097
Law	0.136	0.134	0.127	0.139	0.148	0.151	0.174	0.150	0.142	0.142
Business	0.116	0.119	0.119	0.110	0.130	0.112	0.113	0.120	0.113	0.112
Education	0.070	0.072	0.057	0.062	0.083	0.067	0.074	0.061	0.077	0.063
Other Professional	0.106	0.104	0.087	0.109	0.124	0.081	0.100	0.103	0.089	0.091

Source: 1980-2000 IPUMS, 2009 ACS

Note: Presenting Theil index (GE(1)). For women working full-time, aged 30-44 with an advanced degree.

Table 5: Regression-Based Decomposition of Within Group Income Inequality (in %)

	Math/Physical Science		Engineer / Comp. Science		Life Science		Medicine		Health Professional		Law		Business		Education		Other Professional	
	1980	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*
Family Status																		
Married, No Children	0.80	0.11	0.10	0.03	-0.04	0.02	-0.09	0.08	-0.02	0.10	0.17	0.18	0.07	0.09	-0.12	-0.05	-0.03	0.08
Married, Young Children	-0.12	-0.21	0.17	-0.12	2.25	0.38	0.11	0.31	2.53	0.38	-0.18	-0.34	0.47	-0.10	2.27	0.00	1.58	0.44
Married, Older Children	0.32	-0.01	1.03	0.01	-0.03	0.03	0.78	0.29	1.35	0.13	0.23	0.06	1.58	0.14	2.48	0.86	1.51	0.57
Unmarried, No Children	0.09	0.04	0.01	0.12	0.09	0.41	0.02	0.01	-0.26	-0.05	0.13	0.16	0.04	0.05	-0.17	-0.04	-0.07	-0.12
Work Hours	13.91	12.28	15.84	24.21	17.69	19.03	8.05	8.68	23.44	18.43	19.86	20.98	21.80	23.09	22.32	36.62	24.98	38.27
Age	0.19	4.60	-0.01	0.98	2.47	2.68	8.29	4.00	0.27	0.23	-0.08	0.60	-0.06	1.00	0.36	0.09	-0.04	-0.06
Education	0.02	0.77	0.11	1.62	0.03	1.64	---	---	0.29	0.48	---	---	0.58	1.76	3.17	5.27	0.45	0.40
Residual	84.80	82.42	82.74	73.15	77.54	75.80	82.85	86.63	72.40	80.30	79.88	78.37	75.52	73.99	69.69	57.26	71.63	60.42
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Total Explained by Family Status	1.09	-0.07	1.32	0.04	2.27	0.84	0.82	0.69	3.59	0.56	0.33	0.06	2.16	0.17	4.46	0.77	2.98	0.97

	Single, without Children		Married, Without Children		Married, with Young Children		Married, with Older Children		Unmarried, with Children	
	1980	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*	*1980*	*2009*
Occupation										
Eng/Computer Science	0.14	0.34	0.07	0.09	0.02	0.14	0.00	0.12	0.08	0.14
Life Science	-0.01	0.01	-0.02	0.00	-0.03	-0.01	0.01	-0.03	-0.01	0.02
Medicine	0.09	0.54	0.08	0.34	0.40	1.31	0.35	0.84	0.09	0.74
Health Profession	-0.07	0.31	-0.07	0.30	0.00	0.00	-0.11	0.31	-0.16	0.65
Law	-0.03	0.32	-0.11	0.66	-0.05	0.33	-0.08	0.16	-0.03	0.60
Business	-0.23	0.81	-0.68	0.88	-0.72	0.34	-0.57	-0.44	-0.46	0.38
Education	0.64	5.29	1.47	6.23	2.45	4.89	1.83	8.66	1.34	6.57
Other Profession	1.16	1.57	1.41	1.38	0.72	3.01	0.52	2.12	0.26	2.24
Work Hours	5.77	17.73	12.75	19.88	28.70	25.85	27.60	28.67	13.04	16.39
Age	0.56	1.62	0.70	0.68	0.27	0.67	0.44	0.31	0.70	1.65
Education	0.18	1.27	0.76	1.32	1.60	1.78	2.63	2.46	1.27	3.06
Residual	91.79	70.20	83.64	68.22	66.65	61.70	67.39	56.83	83.87	67.56
Total	100	100	100	100	100	100	100	100	100	100
Total Explained by Occupation	1.70	9.18	2.16	9.90	2.78	10.00	1.95	11.73	1.12	11.34

Appendix 1

Coding of occupational classification scheme into professional occupations from census variable OCC1990, including numeric code. Please note that n.e.c. means not classified elsewhere.

<u>**Science-Related**</u>

1) Math and Physical Science

066 actuary
067 statistician
068 mathematician/math scientist
069 physicists and astronomers
073 chemist
074 atmospheric and space scientist
075 geologist
076 physical scientist, other

2) Engineering and Computer Science

043 architects
044 aerospace engineer
045 metallurigical/materials engineer
047 petroleum, mining and geological engineer
048 chemical engineer
053 civil engineer
055 electrical engineer
056 industrial engineer
057 mechanical engineer
059 other engineer
064 computer systems analysts/ computer scientist
065 operations and systems researchers and analysts

3) Life Science

077 agricultural/food scientist
078 biological scientist
079 forester/conservation scientist
083 medical scientist

4) Dentists and Medical Doctors

084 physicians
085 dentists
086 veterinarians
087 optometrists
088 podiatrists
089 other health and therapy

5) Health Professionals

095 registered nurses

096 pharmacists
097 dietitians and nutritionists
098 respiratory therapist
099 occupational therapist
103 physical therapist
104 speech therapist
105 therapist, n.e.c.
106 physician's assistant

Non- Science Related
6) Lawyers and Judges
178 lawyers
179 judges

7) Business
003 legislator
004 chief executives and public admin
007 financial managers
008 human resource and labor relations manager
013 managers in marketing, advertising and public relations
014 managers in education and related fields
015 managers of medicine and health occupations
016 postmasters and mail superintendents
017 managers of food-serving/lodging establishments
018 managers of properties/real estate
019 funeral directors
021 managers of service organizations
022 managers and administrators
023 accountant and auditors
024 insurance underwriters
025 other financial specialists
026 management analysts
027 personnel, HR, training and labor relation specialists
028 purchasing agents/buyers of farm products
029 buyers, wholesale and retail
033 purchasing managers, agents and buyers
024 business and promotion agents
035 construction inspectors
036 inspectors/compliance officers outside construction
037 management support occupations

8) Education
113/154, teachers, postsecondary
155/163, teachers, except postsecondary

9) Other Professional Occupations

164 librarian
165 archivist/curator
166 economists, market researchers and survey researchers
167 psychologists
168 sociologists
169 social scientists, n.e.c.
174 social worker
175 recreation worker
176 clergy/religious worker
183/200 writers, artists, entertainers, athletes and other professionals, n.e.c.

Appendix 2: Number of Cases, by Occupation, Age, and Year for Working Women with a BA or Higher

Age 30-34	**1980**	**1990**	**2000**	**2009**
Math/Physical Science	326	695	1,089	281
Engineer/Computer Science	812	3,155	4,124	954
Life Science	244	546	711	218
Medicine	722	1,751	2,349	722
Health Professional	5,127	10,820	10,215	2,814
Law	1,360	2,838	3,101	819
Business	8,948	20,210	26,187	6,366
Education	26,495	19,700	23,647	6,703
Other Profession	5,676	7,403	8,399	2,120
Total	*49,710*	*67,118*	*79,822*	*20,997*
Age 35-39				
Math/Physical Science	182	486	1,010	201
Engineer/Computer Science	363	2,063	4,088	905
Life Science	161	399	689	165
Medicine	441	1,599	2,454	730
Health Professional	3,211	10,381	11,424	2,877
Law	751	2,781	2,898	844
Business	5,246	18,249	26,521	6,943
Education	18,685	29,123	23,157	6,726
Other Profession	3,509	7,758	7,926	2,029
Total	*32,549*	*72,839*	*80,167*	*21,420*
Age 40-44				
Math/Physical Science	84	304	771	204
Engineer/Computer Science	191	1,311	3,283	892
Life Science	84	259	647	131
Medicine	288	976	2,279	626
Health Professional	2,418	7,198	13,340	2,546
Law	357	2,225	2,935	662
Business	3,532	15,600	24,595	6,995
Education	13,264	32,213	27,838	6,436
Other Profession	2,239	6,755	8,352	1,896
Total	*22,457*	*66,841*	*84,040*	*20,388*
Total N, Ages 30-34	104,716	206,798	244,029	62,805

Source: 1980-2000 IPUMS, 2009 ACS

Appendix 3: Percentage of Women Aged 30-44 Employed in Professional v. Non-Professional Occupations

	1980	1990	2000	2009
All Women				
Non-Professional	73.26	66.66	65.54	58.47
Professional	26.74	33.34	34.46	41.53
Math/Physical Science	0.14	0.18	0.27	0.34
Engineer/Computer Science	0.43	1.03	1.70	1.82
Life Science	0.09	0.13	0.19	0.27
Medicine	0.19	0.33	0.55	0.97
Health Professional	4.27	5.43	5.42	6.34
Law	0.32	0.63	0.68	1.05
Business	8.81	13.26	13.53	15.56
Education	9.98	9.30	9.08	11.74
Other Professional	2.51	3.04	3.04	3.45
Women with BA or Higher				
Non-Professional	26.28	28.21	30.04	27.15
Professional	73.72	71.79	69.96	72.85
Math/Physical Science	0.44	0.53	0.84	0.82
Engineer/Computer Science	0.99	2.30	3.35	3.17
Life Science	0.35	0.43	0.61	0.63
Medicine	0.99	1.41	1.95	2.42
Health Professional	7.66	10.05	10.21	9.91
Law	1.80	2.92	2.61	2.95
Business	12.47	18.60	22.25	23.74
Education	41.70	28.75	21.79	22.97
Other Professional	7.32	6.80	6.36	6.24

Source: 1980-2000 IPUMS, 2009 ACS

Appendix 4: Descriptive Statistics, by Occupation and Year for Working Women with a BA or Higher

	1980	1990	2000	2009
Mean Age				
Math/Physical Science	34.74	35.44	36.37	36.30
Engineer/Computer Science	34.61	35.36	36.52	36.76
Life Science	35.06	35.59	36.69	35.79
Medicine	35.31	35.87	36.87	36.59
Health Professional	35.58	36.20	37.46	36.77
Law	34.73	36.47	36.86	36.53
Business	35.28	36.41	36.83	37.07
Education	35.75	37.76	37.29	36.86
Other Professional	35.35	36.69	36.90	36.64
Total	35.56	36.86	37.05	36.85
Proportion with Advanced Degree				
Math/Physical Science	0.59	0.47	0.59	0.64
Engineer/Computer Science	0.50	0.31	0.30	0.35
Life Science	0.70	0.53	0.72	0.78
Medicine	1.00	1.00	1.00	1.00
Health Professional	0.41	0.32	0.29	0.35
Law	1.00	1.00	1.00	1.00
Business	0.45	0.30	0.27	0.32
Education	0.58	0.46	0.44	0.54
Other Professional	0.54	0.38	0.32	0.34
Total	0.55	0.42	0.39	0.45

Source: 1980-2000 IPUMS, 2009 ACS