Retention of Women in the STEM Labor Force:

Gender Similarities and Differences with a Focus on Destination Status

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Abstract

While much recent scholarly attention has been focused on getting women into the STEM labor force, less attention has been paid to keeping them in STEM occupations across the life course. This research follows college graduates in the National Longitudinal Survey of Youth 1979 panel who transitioned into the STEM labor force at any point following college graduation. Using multinomial logistic modeling of the hazard of leaving a STEM employer, we estimate the covariates of leaving to take a new STEM job, to move into a non-STEM job, and to exit the labor force for women and men. Survival curves show few gender differences overall in the rate at which women and men leave their first STEM job. Descriptive results show that women are more likely to transition out of the labor force than men, especially following childbirth or when existing children in the household are less than five years old. Yet men are more likely than women to change jobs and move into non-STEM jobs over time, moving disproportionately into managerial or administrative jobs. Contrary to popular accounts of successful women scientists who are single and childless , our results show STEM female jobholders are actually slightly more likely to be married and have children than male STEM job holders, though the differences are not statistically significant. Multivariate hazard models show that preschool aged children disproportionately encourage job moves for women, including moves out of the labor force, while having a partner employed in a STEM field facilitates retention. Over the period of time investigated (1983-2008) and controlling for job tenure, both women and men became MORE likely to change jobs over time. Contrary to models of “job churning” in the early career, these scientists showed longer durations in first STEM jobs following degree completion than in subsequent jobs.

Retention of Women in the STEM Labor Force: Gender Similarities and Differences with a Focus on Destination Status

The National Institute of Health (NIH) and the National Science Foundation (NSF) commit hundreds of millions of dollars annually for education and training programs in postsecondary science and engineering education, given declines in enrollment in Science, Technology, Engineering and Math (STEM) fields. Given these investments and the role of research and development in the US and the global economy, retention in the labor force in these fields, especially the optimal participation of women in the science workplace, has become an important issue. The majority of research, however, has focused on women in academia, evaluating programs to advance women in educational institutions (e.g., Williams, 2000, Committee on Maximizing the Potential of Women in Academic Science and Engineering, 2006; Preston, 2004). Yet most of the STEM labor force is not employed in academic science, and most trained STEM workers will spend little time there. A handful of researchers, focusing on sub sectors, have begun looking more systematically at the factors that determine women's entry and retention into the STEM labor force (e.g., Smith-Doerr, 2004 on biotechnology workers, and Stephan and Levin, 2005 or Gray and James, 2007, on IT workers). A more comprehensive exploration of individual and institutional factors that affect retention in the broader STEM labor force (including government and industry sectors) has been sorely lacking. Moreover, although some research has addressed life cycle events like marriage and childbearing on women's careers, most of this work has been retrospective, asking women to reflect back on their choices (Monosson, 2008).

In this paper, we seek to remedy these exclusions, focusing on college graduates in the National Logitudinal Survey of Youth 1979 panel who moved into STEM occupations following degree completion. Our models identify factors contributing to the job retention of women and men in the STEM workforce, exploring whether those who left STEM jobs moved to another STEM employer, transitioned to other fields, or exited the workforce altogether. We look at attitudes, marital status, and childbearing behavior, as well as firm level factors such as firm size, work hours, benefits, wages, and flexible work practices. We assess how family and institutional configurations contribute to or impede retention in STEM occupations. These factors serve as proximal mechanisms shaping the kinds of jobs initially selected as well as the ability to successfully remain in these occupations.

Background

Increasingly, the underutilization of women in STEM fields has been of concern to policy makers (e.g. National Institute for Health, 2008, Committee on Maximizing the Potential of Women in Academic Science and Engineering, 2006; Committee on Prospering in the Global Economy of the 21st Century, 2007). Specifically, by 2001 women surpassed men in their educational attainment, with 57% of all Bachelors degrees conferred to women (Freeman, 2004). In science, math, engineering and behavioral science (STEM)-related fields of study, women's graduation rates since the 1970s have increased between two to ten times (ibid); by 2001, in some STEM fields like the life sciences, women's graduation rates have surpassed those of men. Women's representation in this workforce, however, is lagging behind: the proportion of all women involved in the paid labor force has increased substantially over time, rising from 43% in 1970 to nearly 60% by 2007, with women accounting for nearly half (46%) of workers in the labor force (Lee and Mather, 2008). In STEM occupations the numbers are less encouraging: In 2003, women were only 27% of the STEM workforce. Some fields, such as engineering, computer science and physical sciences are particularly slow to change (National Science Board, 2008). Women's slower gains in the workforce, however, are not for lack of opportunities: The Bureau of Labor Statistics (BLS) Employment Projections Program indicates that the majority of STEM occupations are expected to grow at or above the national growth rate in the next decade.

Concerns related to these trends are multiple: First, women's underrepresentation suggests diminished returns on public investments in their education and consequently on their potential contribution to their economies (Gray and James, 2007). Second, STEM occupations are linked to higher wages, prestige, favorable conditions and upward mobility (Bartol and Aspray, 2006), and consequently, to women's well-being. Exiting the labor force or transitioning into lower status occupations have implications for women's quality of life and their ability to financially care for their dependent children.

Educational Pathways – The "Pipeline" Model

We start with the common analogy of water flowing through a channel. The pipeline model argues that at each education and professional level (from high school to college to graduate school to early career) the "flow" of women is weaker (Levin and Stephan, 2005). Bystydzienski (2006) claims that crucial pipeline barriers are "weed-out" practices, common at the Bachelor's level science disciplines in large universities, where large introductory courses, based on a competitive male model are designed to eliminate excess students, using stress and humiliation (Bystydzienski, 2006: 7). Others argue that women perceive science as masculine – objective and detached (Gunter and Stambach, 2005). Rosser (2000) summarizes studies that show that women are attracted to science occupations that "help others" and do "something worthwhile for society" (p. 19), which may explain their leaning towards life sciences. Another key barrier to the women's educational success is aptitude perceptions. Barres (2006) believes that the foremost factor for women's underrepresentation in science is the societal assumption that women are innately less able than men. Women who switch from physical sciences to biology (the majority of switches), however, do not do so because of failing grades, or inaptitude (Rosser, 2000). Most existing interventions address women's perceptions, expectations, and choice and focus on fitting them into academic departments, programs and labs (Bystydzienski, 2006). These interventions, as the trends above indicate (Table B1), have generally been successful, narrowing the gender gap in educational attainment, with some fields slower to catch up, e.g. engineering, computer science and physical science. Computer science, in particular, has seen a reversal of educational gains made in the past: In 1984-5 women accounted for 37% of the discipline's graduates, while by 2000-1 they were only 28% of the degree recipients (Freeman, 2004). Moreover, critics of the "pipeline model" argue that some science fields with similar graduate student numbers nevertheless show differential access to career paths.

Career Pathways – Beyond the "Pipeline"

Critics of the pipeline model argue that focusing on "supply-side" explanations and policies neglects structural explanations related to women's entry and retention into the science labor force (Etzkowicze et al, 2000; Smith-Doerr, 2004; Rosser, 2004; Xie and Shauman, 2003). There are four primary factors affecting women's employment in scientific and engineering occupations after the requisite period of education and training – (1) Attitudes and expectations towards work and family (2) Work-Life Balance challenges or women's reluctance to transition into jobs in which they cannot maintain a balance between career and family demands; (3) employer practices, including hiring and/or promotion policies, available benefits, the availability or lack of mentors and role models, and workplace culture (e.g. hours, norms of behavior); and 4) Regional Industrial Cluster, i.e, location within a broader industrial cluster as opposed to an isolated firm. Our analysis will address the first three of these factors.

(1) Attitudes and Expectations

The broader literature on women's employment suggests that young adults' attitudes towards family formation and maternal employment are predictive of their future investments in schooling, careers, and family care, and also predict their later work hours and earnings (Corrigall and Konrad, 2007). Support for egalitarian family roles for men and women is positively associated with women's fulltime employment and both men's and women's delayed entry into marriage and parenthood

(Cunningham, et al., 2005; Sassler and Schoen, 1999). The influx of mothers into the paid labor force during the 1960s and 1970s was instrumental in altering the gender socialization of children (Brewster and Padovic, 2000; Moen, Erickson, and Dempster-McClain, 1997). For example, maternal employment is positively related to gender egalitarianism in both sons and daughters (Davis and Pearce, 2007; Hoffman, 1989; Thornton, Alwin, and Camburn, 1983). This literature suggests that the increasing likelihood of experiencing maternal employment, in conjunction with the liberalization of gender role attitudes on the part of men and women, should result in cohort change in the likelihood of women's pursuit of occupations in traditionally male-dominated fields. Men's participation in the paid labor force, as well as pursuit of particular occupations, should be less responsive to gender role attitudes expressed in young adulthood, because gainful employment remains normative for men (Gerson, 1993; Kaufman and Uhlenberg 2000). According to those proffering supply-side explanations for gender differentiated labor force participation rates and earnings differentials, women with more traditional attitudes towards work and family are more likely to focus their pursuits on family responsibilities, and deemphasize employment and career aspirations (Becker, 1971; Firestone, Harris, and Lambert, 1999). In fact, research utilizing data from the NLSY found that stronger adherence to traditional gender ideology negatively affected the earnings of white and black women, though they do not have a similar effect for white men (Christie-Mizell, 2006).

While men's egalitarian attitudes may not directly influence their own STEM workforce participation, the attitudes of male workers within STEM fields may be particularly consequential nonetheless for women STEM graduates. Preliminary work with the NLSY shows that men majoring in STEM fields were more gender traditional in their attitudes about mothers' work roles than other male college graduates (Sassler, Levitte, Glass, and Michelmore (2011). To the extent that male co-workers and managers are resistant to changes in workplace practices that accommodate women's parenting and family care obligations, women may ultimately decide that STEM employment is more risky than employment in non-STEM occupations.

(2) Work-Life Balance Issues: Trends in Union and Parental Status of the Female Labor Force

Although adherence to more egalitarian gender role beliefs delays entry into both marriage and parenting, and increases the likelihood of cohabiting (Clarkberg, Stolzenberg, and Waite, 1995), the majority of young adults eventually do wed (Schoen and Standish, 2001). The union and parental status of the female labor force have changed in important ways over time. Whereas unmarried women (including never married, widowed, and divorced women) historically were substantially more likely to work in the paid labor force than were married women (Mellott and Sassler, 2007; Golden, 1990), in recent decades married women – particularly mothers – have experienced dramatic increases in labor force participation (Bianchi and Cohen, 1999). The majority of mothers, even those with pre-school aged children, are now employed in the paid labor force (Bianchi and Cohen, 1999; Downs, 2003). For example, over three-quarters (77%) of mothers with school-aged children were employed in the labor force in 2005, as were well over half of mothers with pre-school aged children (Lee and Mather, 2008). As a result, the majority of American women work upon completing their education, after getting married, and even subsequent to becoming mothers. Recent research documents that the difference in employment rates between mothers and childless women in professional and managerial occupations has shrunk across cohorts (Percheski, 2008). But a growing body of research finds that academic science and medicine are fields in which women have fewer children than they desire (Mason and Goulden, 2002; Long 2001), and that women in these fields face considerable time pressures and productivity demands during precisely the period of marriage and family formation (Jacobs and Winslow, 2004).

As educational homogamy increases (Schwartz and Mare, 2005), and post-secondary schooling increasingly serves as a marriage market, the propensity for couples to share occupational levels has grown (McLanahan, 2004; Stone, 2007). But when both spouses work in time-intensive occupations, the introduction of children poses particular challenges that are more often assumed by mothers than fathers (Moen and Sweet, 2003). A recent report exploring why women remain a small portion of science and engineering faculty at research universities finds that a key barrier to women's advancement is the built-in expectation that faculty members have substantial spousal support; lacking the support traditionally provided by a "wife," the writers find, puts faculty members at a serious disadvantage (Committee on Maximizing the Potential of Women in Academic Science and Engineering, 2006:4). The majority of faculty, the authors explain, lacks this kind of support, and women seem at a greater disadvantage in this respect: whereas 90% of women faculty in science and engineering are married to full-time employees, only slightly less than half of men are married to full-time workers (ibid). Consequently, Xie and Shauman's (2003) finding that female scientists are much more likely to be single or divorced than are their male counterparts is not surprising.

In addition to marital status, which was once the dominant signal of reduced work orientation for employers, a growing body of evidence suggests that among recent cohorts the primary signifier is now parental status (Hewlett, 2002; Stone, 2007). Changes in parental status are strongly linked to women's employment patterns (Rindfuss, Cooksey, and Sutterlin, 1999). The arrival of children brings an increase in women's domestic labor. The introduction of children into the family system also reorients both men's and women's labor force hours; children decrease women's hours of paid work, while they have the opposite effect for men (Kaufman and Uhlenberg, 2000). Because many families transition to a more traditional division of household labor upon the arrival of a first child (Becker and Moen, 1999), women are more likely than men to alter employment behavior to accommodate the increase in child care and housework growing families introduce. The implications of this shift to more traditional gender roles on women's careers and occupational attainment are clear; women's transition to greater parenting responsibility negatively affects occupational mobility, earnings, and career success (Hersch & Stratton, 2002; Kaufman & Uhlenberg, 2000; Stone, 2007). Recent evidence suggests that parity, rather than parental status per se, or the challenges of adjusting to the shifting care schedules and increased socialization needs of growing children results in maternal exits from the labor force (Raley, Mattingly, and Bianchi, 2007). Stone (2007) found many professional women justified their labor force exit by discussing the increased demands that entrance into elementary school posed, with their curtailed hours and increased need for participatory instruction (with homework, extra-curriculars, and the myriad responsibilities deemed necessities of middle-class existence; see Lareau, 2003); others indicated that what had been manageable with one child became less so with each subsequent child.

In a study of science career paths for bachelor's degree holders, Xie and Shauman (2003) found that married women, particularly those who have children, were much more likely to exit from both school and work than were men and women in other family statuses (p.116). Moreover, in respect to geographic mobility, the presence of children limits women scientists' migration significantly more than that of men in these occupations. Marriage alone, they argue, does not constrain dual career couples. In a later study, however, Shauman and Noonan found that married women are less likely to move to advance their own careers and more likely to move to advance their partners careers than married men (Shaumann and Noonan, 2007). Consequently, married women are also far less likely to see their earnings increase after a residential move than married men. Employers seeking to minimize turnover and avoid costly investments in employees unlikely to stay with their firm may use marital status as a basis for avoiding otherwise qualified women.

(3) Workplace Culture and Practices

Structural characteristics of careers in science and engineering, such as long hours of work and frequent travel, run on a collision course with childbearing and parenthood, and may encourage women to choose less demanding jobs outside their primary field of study. The cultural consensus on which sex should do which jobs means the gendered division of market work does not only depend on the preferences of individuals. Reskin and Bielby (2005) argue that employers often incorporate a sexual division of labor into employment structures and practices. For example, making assumptions about the sex of the workforce, female jobs are far more likely to be structured as part time compared to male jobs. Highlighting academe, they note that in the academic tenure system assistant professors are expected to do the work on which their tenure decisions rest during the same years in which they start their families (Reskin and Bielby, 2005: 73-4). Some evidence also suggests that workplace cultures are more regulated and more family friendly in government, compared to the private or higher education sectors (Golden, 2008; Barnett et al., 2004).

Evidence suggests that scientists who become mothers are disadvantaged as early as the recruitment process. Mason and Goulden found that mothers are half as likely as single women and men to land a faculty position (2004, cited in Committee on Maximizing the Potential of Women in Academic Science and Engineering, 2006). The clear signals for employers to engage in market discrimination against women are motherhood and, to a lesser extent, marital status. As Ridgeway and Correll have theorized, motherhood functions as a status characteristic, or marker of generalized lower commitment and ability to achieve for an employer. Employers use status characteristics, like race and age, to infer attributes of job applicants which cannot be readily observed. This is the basis of statistical discrimination, in which employers use information (sometimes erroneous) about group characteristics to make probabilistic inferences about individuals. In audit studies (Correll, et al, 2007), subjects asked to evaluate identical resumes consistently rated the resumes of mothers lower on a host of competency factors compared to fathers or women without children.

Even after getting hired, women can face stereotypes related to performance resulting from their isolation, lack of mentors, and difficulty gaining credibility among peers and administrators. Much of the literature on the role of mentors in the sciences has focused on the pipeline and especially on doctoral careers, showing positive correlations between presence of mentor and performance of student. Interviewing women scientists, Preston (2004) found that positive mentoring was perceived as an important prerequisite for women's career success in science. Given the dearth of senior women in STEM professions, lack of mentors limits the younger generation's access to networks of necessary professional information for success.

Although employers often hold negative attitudes towards women scientists, anticipating marriage or childbearing for those women not already married or parents, actual adverse effects of parenthood or marriage are less likely among highly educated women and women whose jobs required long training periods (Klerman and Liebowitz, 1999). These women are more likely to receive paid maternity leave through their jobs, are less likely to leave paid work, and if they do, they return to work more quickly. There is now considerable evidence (Glass and Riley, 1998; Stone, 2007; Waldfogel, 1997) that women are more likely to maximize their earnings and remain in jobs with generous paid leaves for childbearing and flexible work hours. In addition, professional women are better able to afford high-quality child care than women with less valued credentials, though they cannot always procure the care they most desire (Riley and Glass, 2002). Jacobs and Gerson (2004), on the other hand, have shown, the "time bind" facing American workers is concentrated among professional and managerial workers with children. The long hours demanded of highly paid professionals exerts considerable pressure on women to withdraw from professional jobs after children arrive, especially if they have a spouse who is also employed in a time-intensive occupation (Stone, 2007).

Hypotheses

In this paper we seek to determine the factors predicting retention in STEM occupations. We assess the impact of young adult gender ideologies and family expectations, union and parental status and changes in these statuses, and workplace characteristics and culture on the probability of remaining in a

STEM-related occupation, transitioning to a non-STEM occupation or exiting the workforce altogether. We also compare women's retention in STEM occupations to men in these occupations, focusing on potentially significant gender differences in the retention process.

Using our three sets of explanatory variables, we explore the following hypotheses

Broad demographic trends
H1: Men will be more likely to remain in broad STEM-related occupations than their female counterparts who entered similar occupations.
H2: Women who enter life science occupations will be more likely to remain in these occupations than women from other STEM fields (i.e., physics, math, engineering).

Family Expectations and Beliefs about Gender
H3: Women with more traditional gender ideologies and expectations for marriage and children will be less likely to remain in STEM-related fields.

H3a. However, holding more traditional gender ideologies and expectations for marriage and children will positively affect men's retention in STEM occupations.

Union and Parental Status
H4: Women who marry will be less likely to remain in STEM occupations than women who remain unpartnered (single) or who enter cohabiting unions, or men irrespective of their union transitions.

H4a: The likelihood of remaining in a STEM-related occupation will decline for women who relocate, especially when relocation co-occurs with marriage.

H4b: The likelihood of remaining in a STEM-related occupation will be lower for women whose spouse is in a related occupation, but we do not expect men's occupational retention in STEM related occupations to be negatively affected by their spouse's occupation.

H4c: The likelihood of remaining in a STEM-related occupation will decline as the proportion of relative income contributed by the respondent's spouse increases.

H5: Parenthood will adversely affect the likelihood remaining in a STEM-related occupation for women, but not for men.

H5a: The negative consequences of parenting will differ depending upon the parity of the mother, and will be greater for the second child than for the first. We do not expect the number of children to affect men's job retention.

H5b: Regardless of parity, as children age they should exert stronger and more negative impacts on the likelihood of women remaining in a STEM occupation.

Workplace Characteristics and Culture
H6: Women employed in larger firms are more likely to remain in STEM-related jobs, since their workplace would be able to offer more opportunities for upward mobility and to afford more family-friendly benefits.

H6a: Women whose employer offers family-friendly benefits (parental leave, telecommuting, and schedule flexibility), are more likely to remain in STEM occupations.

H6b: Women are more likely to remain in STEM-related jobs that require 45 hours or less per week.

H6c: Women in STEM-related government jobs will be less likely to transition into non-STEM jobs or leave the labor force than those working in academe or industry.

Data

The National Longitudinal Survey of Youth of 1979 (NLSY79) is a survey sponsored by the Bureau of Labor Statistics (BLS), U.S. Department of Labor. The NLSY79 (1979-2008) is an ongoing panel survey of a nationally representative sample of 12,686 young men and women who were aged 14-22 in 1979. Data were first collected in 1979 and respondents were reinterviewed annually through 1994 and biennially from 1996 to the present. In the past several rounds the cohort has aged into midlife, enabling us to explore the career trajectories of women who studied STEM-related topics when they attended college in the 1980s and early 1990s. The NLSY79 employed a multistage stratified random sampling design to construct a sample that is representative of the entire population of youth age 14 to 22 as of December 31, 1978 and residing in the U.S. on January 1, 1979. Response rates for the initial interview of the NLSY79 were high (87%) and retention rates have ranged from 77.5% to 96.1%.

A particular strength of the NLSY79 is the availability of information on young adults' work aspirations, detailed information on their fields of study, and occupational pursuits over time. Whereas most studies of women in science have relied on small-scale qualitative studies, or surveys of professional women at a static point in time, the use of the NLSY allowed us to study women's pursuit of occupations in STEM when the proportion of women attending college began equaling that of men (Freeman, 2004) and expectations for equality were high. We were able to follow this cohort as they transitioned into occupations and family roles. In addition, by 2008 the survey offered a long enough time span to follow women into mid-career, and covered the bulk of decision-making regarding marriage and children.

For our analytic purposes, we transformed the individual longitudinal records of college graduates who ever worked in a STEM occupation in the NLSY into person-year records for each wave of data. This meant that some individuals were represented many times in the data proportionate to the number of years/waves of data in which they were employed in a STEM occupation. Each person-year record contained historical information on that respondent, as well as the current time-varying characteristics of the person, their job, and their household. Each record also included the respondents' job status in the next wave of data (t+1), which constitutes our outcome measure. From the 961 male job spells in STEM and 730 female job spells in STEM in the NLSY sample of college graduates between 1979 and 2008, we accrued 4151 person-year records. Men contributed 2795 records while women contributed 1356.

Outcome Measures

We examined three labor force transitions that could occur between each person-year of observation for those respondents in the STEM labor force following college graduation.[1] For definitional purposes, a "job spell" consists of the consecutive observations during which R reports the same employer. At each subsequent wave, respondents currently employed in STEM occupations could end their job spell by making one of three moves for which we created categorical responses: (1) movement into another STEM job with a different employer (2) movement into a non-STEM occupation in the next wave, or (3) exiting from the labor force (if respondents note they are no longer in the labor force after being employed in a previous wave, we consider that person to have exited the labor force). Respondents in STEM jobs who remained with the same employer constituted the comparison group for analytic purposes.

Control Variables

We used several variables, some constant and some time-varying, to identify basic trends in the retention of STEM workers: (1) gender [coded 1 if female]; (2) year of observation [coded from 1 to 29 to correspond with years 1979 through 2008] (3) educational attainment [coded 1 for holding an advanced degree] and field of study in college with separate indicators for biological sciences, hard sciences,

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[1]See Appendix 1 for the occupations defined as STEM related for purposes of this analysis. We exclude medicine (except faculty at medical schools), nursing and ancillary health professions from the definition of STEM employment.

engineering, and computer science, and (4) respondent's duration with the current employer tenure/age of the respondent measured in years.

Work-Family Expectations and Beliefs about Gender

Respondents were asked a series of questions in 1979, when the panel was 14 to 21, designed to measure attitudes to a variety of factors that could affect occupational aspirations and achievement. Gender ideology was measured by a series of eight questions about women's and men's role in the workforce and family, recoded so that high scores indicated a more conservative gender ideology. Occupational expectation was tapped by a single item assessing whether the respondent expects to be working in a STEM occupation at age 35. The respondent's expected age at marriage was assessed and recoded to 1 if marriage is planned after age 30. Finally, fertility expectations were measured by asking the number of expected children, recoded to 1 if the respondent expected to have no children. These early expectations are used as controls for unmeasured work motivation and investment that may affect retention and upward mobility in STEM occupations.

Union and Parental Status

The NLSY79 collected detailed data at each wave on union status and union transitions. From these we constructed a set of three dummy variables that distinguish whether respondents are (1) currently married and stayed married between survey waves, (2) got married between the current and consecutive survey wave, or (3) were married but are no longer married at the consecutive survey wave. The reference category for this set of dummy variables will consist of stably unmarried respondents. Regarding parental status, we constructed indicators for the number of children in the household and whether the oldest child was under 5. For the survival analysis (described below), the birth of a child between survey waves was utilized as a time-varying covariate, along with the number of children and the age of the oldest child.

Employment attributes of spouses and partners are also key factors of study. The occupation of spouse is measured at every survey wave. We constructed a dummy variable for spouses who also work in STEM related occupation. After experimenting between spouses' actual earnings and the percentage of family income earned by the respondent, we used the latter to indicate the extent to which spousal earnings are important for family support. A measure of relocation was created whenever respondents moved across zip codes between survey waves.

Workplace Characteristics and Culture

The NLSY Employer Supplement contained detailed questions about the current job that we used to measure a variety of job characteristics. We created a dummy code for waves contained in the respondents' first STEM job spell since this is each respondent's introduction to the STEM labor market. Annual earnings at the main job were reported in thousands, while hours of work were divided into the number under 45 and the number over 45 to test specific hypotheses about the consequences of overwork. Another indicator measured the number of weekly hours worked at home. An indicator for government employment was created, along with dummy variables for employers who offer flexible work schedules, parental leave, and health insurance. Firm size was measured as the number of paid employees at the respondent's worksite and at all locations owned by the employer. This can also be used to infer the level of bureaucratization in the respondent's job, assuming that a more bureaucratic organization is able to provide more family friendly policies, and has more checks and measures for equity practices.[2]

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[2] Flexible scheduling was measured by responses to the question: Does your employer make flexible hours or work schedule available to you? Note that positive responses to this item indicate the availability of flexible hours but not necessary the use of a flexible schedule. Working from home was measured by the item: How many hours per week do you usually work at this job at home? Work hours were measured with this item : How many hours per week do you usually work at this job?

Survival Analysis

We used the variables described above to identify the hazard of leaving a STEM-related occupation for each of three destination statuses. We conducted survival analysis of the duration of each job spell in which the respondent reported working in a STEM related occupation until either (1) they transitioned to another STEM employer; (2)) they transitioned to a non-STEM occupation ; (3) they exited from the workforce; or (4) they reached the final survey interview (i.e., their job spell was censored in 2008). We relied on discrete-time event history techniques, based on person-years of risk assessed from the completion of the highest degree. Our survival analysis treated the first three events above as competing risks using multinomial logit models (Allison, 1995). For all respondents who entered a STEM occupation, we included a record for each subsequent wave in which they were still in a STEM occupation until they either left for another STEM job with a new employer, left for a non-STEM occupation, exited the labor force, or the panel ended, after which that individual was censored. We included the current duration of employment in a STEM job as a time-varying covariate at each wave, as well as a control variable measuring the number of times a respondent appears in the sample to preserve the representativeness of the sample.

Models incorporated time invariant and time varying covariates (including children born or added to the respondents' household between survey waves) and took the following form for each of the three destination statuses:

$$\text{Log}[P(t+1) / (1 - P(t+1))] = a(t) + ß_1 x_1 + ß_2 x_2 (t)$$

where x_1 represents time-constant covariates, x_2 represent time-varying covariates, log [P(t) / (1-P(t))] is the logit transformation of the probability that an individual experiences a job exit for a particular destination status by time t +1, and the intercept varies with time in the spell. Next, we estimate proportional hazards models that formally test whether men and women differ in their timing to job departure, before and after controlling for demographic variables. Finally, we examine gender differences in the determinants of job changes for each of the three destination statuses using a pooled model with gender interactions.

Results

The descriptive statistics for the sample of person-years are presented in Tables 1 and 2. Table 1 shows the distribution of person-years across destination statuses, with the first panel revealing that the largest number of spells ended with a transition into non-STEM employment for men, and a transition out of the labor force for women (with moves into non-STEM employment a close second for women). Among those who left for a non-STEM job between survey waves, the second panel of Table 1 shows that almost one third of the men moved into managerial and administrative jobs, while only 20% of the women did so. Most movers of both sexes, however, moved into non-STEM jobs outside the social sciences and business fields.

While relatively few respondents ended a STEM job spell by moving to a new STEM job, a substantial number of trained STEM scientists moved back into STEM employment from non-STEM jobs over the period of observation. In other words, while STEM to STEM job mobility was less common, moves back into STEM jobs after a period of non-STEM employment were relatively frequent and helped balance out the large number of transitions out of the STEM labor force. Among men, for example, 570 spells ended with a move to a non-STEM job while 325 spells began with a move from a non-STEM job back into STEM employment. The comparable figures for women were 271 moves out of STEM employment and 119 moves back into the STEM labor force.[3] This evidence of job churning into and out of the STEM labor force slows but does not halt the gradual attrition of trained scientists out of STEM occupations over time. By the end of the time series (and using only those respondents who could be followed to the last wave of data), only 25.9% of the men who ever held a STEM job following degree completion were still in a STEM occupation, and only 15.8% of the women were still in a STEM occupation. These are substantial rates of attrition over time, especially given that the average respondent was only 45 years of age (mid-career) at the last survey wave.

Table 1 about here

Now that the basic trends in STEM employment over time have been outlined, we turn to the determinants of job mobility for men and women in the STEM labor force. Table 2 reports descriptive statistics for both sexes on all variables used in the analysis of person-year records.

Table 2 about here

The women contributing job spells to this analysis were more likely to be biology and less likely to be engineering majors in college, and less likely to hold advanced degrees compared to men in STEM job spells. These women were more likely to expect to be childless, but less likely to expect they would delay marriage. In reality, the women were both more likely to be married and more likely to have children at midlife, though these gender differences were not large. The men contributing STEM job spells, by contrast, earned more, worked more hours, and thus contributed a greater percentage of household income, worked in bigger firms with better family benefits, but were less likely than the women to work for government. All these differences in job attributes suggest that women and men were positioned in different sectors of the STEM labor market, with men holding more advantaged positions that seemed to require longer work hours.

The results of our survival analysis are presented in Tables 3 and 4. Table 3 presents the models for women while Table 4 reports the same coefficients for men. We performed pooled comparisons on all models to detect gender differences in coefficients and report them when applicable. In each table, variables were added to the survival analysis in blocks representing the sets of variables outlined in our hypotheses. Block 1 includes only baseline trends and educational attainment measures, block 2 adds measures of work-family expectations and beliefs about gender, while block 3 includes union and parental status, including spouse characteristics. Finally in block 4, workplace characteristics and culture were added to the multinomial logit models of job leaving. We report the results for each of our targeted hypotheses from these models below.

Broad demographic trends

H1: Men will be more likely to remain in broad STEM-related occupations than their female counterparts who entered similar occupations.

From tables 1 and 2, we saw that job tenures for men's and women's job spells were not significantly different, but men were less likely to transition out of the STEM labor force over time, with both higher rates of moving from STEM to STEM jobs, and lower rates of moving out of the labor force. Men were also more likely to return to STEM jobs from non-STEM employment or spells out of the labor force. Pooled multinomial models confirmed that women STEM employees had significantly higher

[3] Very few of the moves back into STEM employment for women occurred following a spell out of the labor force, however. Less than 8% of the women who left the labor force came back to a STEM job during the period of observation, although around 63% of them returned to the labor force in some capacity.

hazards of leaving to take non-STEM jobs and leaving the labor force. The period coefficient (calendar year) was significantly larger for women than men and indicates women in STEM sped up their job changes relative to men as the years progressed from the 1980's to the early 21st century.

H2: Women who enter life science occupations will be more likely to remain in these occupations than women from other STEM fields (i.e., physics, math, engineering).

While it was definitely true that women in the biological sciences were far less likely to leave their STEM job for a new STEM employer than the women in the other STEM fields, there were no field of study differences in the propensities to move to non-STEM work or move out of the labor force.

Family Expectations and Beliefs about Gender

H3: Women with more traditional gender ideologies and expectations for marriage and children will be less likely to remain in STEM-related fields.

H3a. However, holding more traditional gender ideologies and expectations for marriage and children will positively affect men's retention in STEM occupations.

Surprisingly few effects of gender ideology and family expectations were found for women, particularly after controlling for actual family status in block 3 of Table 3. Expecting to delay marriage was the only variable with significant impact on retention among women, discouraging both moves out of STEM for non-STEM jobs and moves out of the labor force. But expecting to delay marriage also discouraged job moves out of STEM for non-STEM jobs among men. Holding more traditional gender ideologies as a young adult did significantly discourage job moves out of the labor force for men but did not encourage them among women.

Union and Parental Status

H4: Women who marry will be less likely to remain in STEM occupations than women who remain unpartnered (single) or who enter cohabiting unions, or men irrespective of their union transitions.

H4a: The likelihood of remaining in a STEM-related occupation will decline for women who relocate, especially when relocation co-occurs with marriage.

H4b: The likelihood of remaining in a STEM-related occupation will be lower for women whose spouse is in a related occupation, but we do not expect men's occupational retention in STEM related occupations to be negatively affected by their spouse's occupation.

H4c: The likelihood of remaining in a STEM-related occupation will decline as the proportion of relative income contributed by the respondent's spouse increases.

Getting married, being married, and getting divorced hardly mattered for job retention among STEM employees of either gender. Newly married men were significantly less likely to leave the labor force than other men, but so few men actually left the labor force in these data that we tend to believe the large coefficient here is the result of an influential outlier. Like other studies have shown, women's labor force participation is becoming more normative following marriage and less damaging to women's earnings in recent cohorts. Marriage no longer serves to mark the beginning of increased domesticity among women as it has in the past. While residential moves affected women, they operated in the opposite fashion of that hypothesized. Residential moves actually reduced within-STEM job switching, while having no effect on moves to non-STEM jobs or moves out of the labor force. Among men, however, residential moves both facilitated STEM to non-STEM job shifts and dramatically lowered moves out of the labor force (suggesting that men rarely move without secure employment at their destination).

Spouse characteristics, not surprisingly, mattered more for women than men but again not in anticipated ways. Contrary to our hypothesis, women whose partners also worked in STEM fields were *less* likely to leave STEM for non-STEM employment or moves out of the labor force. Perhaps having a husband who shares a scientific or technical background provides women with more social support and practical assistance in persisting in STEM jobs. Partner's occupation had no impact on men's retention, as anticipated. The proportion of income earned by the respondent decreased women's risk of leaving the labor force but had no impact on jobs moves to other STEM or non-STEM jobs. We had anticipated that greater income-generating responsibilities would lower the risk of leaving the labor force for women, and also that men would be unaffected by their partner's economic contribution.

H5: Parenthood will adversely affect the likelihood remaining in a STEM-related occupation for women, but not for men.

> H5a: The negative consequences of parenting will differ depending upon the parity of the mother, and will be greater for the second child than for the first. We do not expect the number of children to affect men's job retention.
>
> H5b: Regardless of parity, as children age they should exert stronger and more negative impacts on the likelihood of women remaining in a STEM occupation.

Parenthood did in fact generate much greater reactivity among women than other family statuses, while barely affecting men. Women who added a child to their household or whose oldest child was under 5 were significantly more likely than other women to leave the labor force. Men, by contrast, were unaffected by the number or presence of preschool children, although there was a surprising increase in their risk of leaving the labor force when adding a new child (which we again attribute to influential outliers in the very small sample of men who opt out). Our hypotheses about parity, however, were not supported. Neither increasing the number nor increasing the ages of children in the household increased job leaving of any kind among mothers. Older children, as mentioned above, insulate women somewhat from the risk of labor force exits. While there is much speculation about the second child (or older children) generating demands that push professional women out of the labor force, little evidence to support these scenarios can be found here.

Workplace Characteristics and Culture

H6: Women employed in larger firms are more likely to remain in STEM-related jobs, since their workplace would be able to offer more opportunities for upward mobility and to afford more family-friendly benefits.

> H6a: Women whose employer offers family-friendly benefits (parental leave, telecommuting, and schedule flexibility), are more likely to remain in STEM occupations.
>
> H6b: Women are more likely to remain in STEM-related jobs that require 45 hours or less per week.
>
> H6c: Women in STEM-related government jobs will be less likely to transition into non-STEM jobs or leave the labor force than those working in academe or industry.

While our hypotheses about workplace characteristics focus only on women, we found both genders to be reactive to working conditions. Men, rather than women, were more easily retained in large firms, but with respect to moves to other STEM jobs. Earnings affected both groups but in slightly different ways – higher earnings kept men from seeking other STEM jobs, while higher earnings prevented women from leaving STEM for non-STEM jobs. The work-family policies we believed might slow women's departure from STEM jobs had no effect, except for the paradoxical effect of employer provided health insurance, which sped up transitions out of STEM jobs into non-STEM or labor force exits. This makes little sense from a theoretical point of view; however health insurance may be less important for married women if they are actually covered by their spouses' insurance. The fact that health insurance showed a mild negative impact on transitions into non-STEM employment among men suggests its importance in covering family members.

Work hours showed highly significant relationships to retention. Our hypotheses regarding work hours were mostly borne out. Hours up to 45 per week discouraged moves out of STEM among women, while hours above those encouraged moves out of STEM for non-STEM jobs (but did not encourage moves out of the labor force). Men seemed to be more reactive to overtime hours, which increased their risk of moves out of STEM but did not affect moves to other STEM jobs. For both genders, the greater the overtime hours worked per week, the stronger the attraction of non-STEM employment seemed to be.

Government employment turned out to be no panacea for the retention of STEM workers. Neither women nor men displayed any reactivity to working in government rather than industry or academe, despite anecdotal and statistical evidence that more women than men with STEM degrees are opting for nonacademic employment. In future analyses we plan to disaggregate academic employment whenever detectable to search for specific negative effects on women's retention.

Tables 3 and 4 about here

Figure 1 presents cumulative survival graphs for each gender by parental status combination in the NLSY data at the end of the first STEM job spell experienced, which is the spell closest to degree completion. All groups show rather steep declines over time, but significant variations also exist. As can be clearly seen from the figures for parents, both mothers and fathers experience longer durations in first job than non-parents. This perhaps suggests the role of children in rooting parents in a single geographic place, making relocation for employment difficult. Although the curve is somewhat steeper for mothers than fathers, mothers are still more likely to persist in the first job than women without children. Contrary to stereotype, motherhood did not seem to propel women out of their first stem job relative to women without children. Although we have not yet modeled later jobs, there is no evidence from the models presented for either gender that suggests the dynamics of first jobs are different from later jobs.

Figure 1 about here

Conclusions

The results presented here confirm that the dynamics of family life contributed most strongly to gender differences in the retention process within STEM employment. However, both men and women experienced a slow erosion from STEM employment over time – only 26% of the men and 16% of the women in the NLSY who ever worked in a STEM occupation were still employed in a STEM job by the end of the time series . Movement into and out of STEM employment was relatively common across the careers of the college educated STEM workers followed here, but movement out was eventually stronger than movement in.

Nor were movements out of STEM jobs disproportionately clustered around applied science occupations, especially allied health professions (medicine, pharmacy, nursing, medical technologists and technicians). Stronger movement pushed men (and women to a lesser extent) from STEM jobs into administrative or managerial jobs. Women were more likely to move out of the labor force, most significantly in response to childbirth and the presence of children under 5 in the household. While reemployment rates overall were high among these women, few were able to reenter STEM employment and chose non-STEM jobs instead.

We intend to pursue further analyses of the job histories of these STEM workers, particularly searching for job or employer attributes that can help explain this slow erosion from STEM occupations among women and men. For women, we suspect the gender composition of the workplace/occupation and their promotion history will be of special importance in retention, while for men promotion history may propel them out of STEM and into managerial or administrative positions. We also plan to extend this work by incorporating geographic information into our models, particularly personal and spousal employment in high-tech clusters or corridors, as well as geocoded information on residential moves corresponding to job changes.

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Figure 1

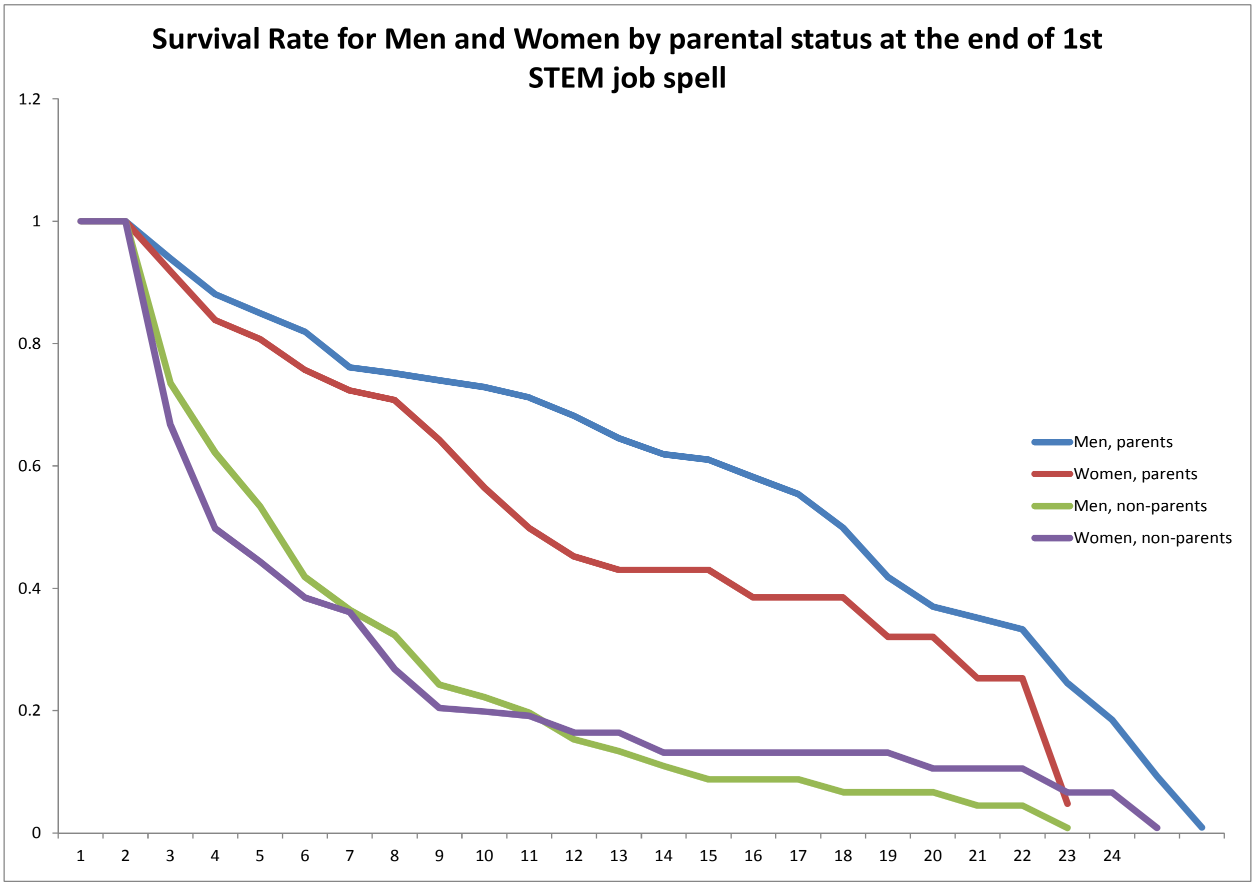
Survival Rate for Men and Women by parental status at the end of 1st STEM job spell
1.2
1
0.8
0.6
0.4
0.2
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Men, parents
Women, parents
Men, non-parents
Women, non-parents

Table 1. Transitions into and out of STEM jobs, destination jobs following a STEM exit, by gender

Person-Year Transitions into and out of STEM jobs

	Male	Female	Male	Female
	N	N	Mean	Mean
Stayed in STEM , same employer	1,509	507	54.0%	37.4%
Stayed in STEM , new employer	251	95	9.0%	7.0%
Left STEM for non-STEM	570	271	20.4%	20.0%
Left Labor Force	103	332	3.7%	24.5%
Returned to STEM i job	325	119	11.6%	8.8%
Left STEM for allied health professions	37	32	1.3%	2.4%
Total	2,795	1,356	5,191	3,849

Occupation in next time period for individuals who transition out of STEM, in person-years

	Male	Female	Male	Female
Non-STEM Occupation	334	185	58.6%	68.3%
Financial Operators	24	14	4.2%	5.2%
Social Scientists	13	10	2.3%	3.7%
Post secondary Professors (Social Sciences)	15	5	2.6%	1.8%
Managers and administrators	184	55	32.3%	20.3%
Nurses	0	2	0.0%	0.7%
Total	570	271	570	271

Source: National Longitudinal Survey of Youth, 1979 sample of all college graduates who pursue a STEM job at some point in their careers

Table 2. Descriptive Statistics by Gender

	Men		Women
	Means		Means
Job tenure (in years)	3.858		3.94
Calendar Year	1991.38	***	1992.49
Age	30.41	***	31.08
Education			
Biology Major (1=yes)	4.4%	***	6.9%
Computer Science Major	13.7%		12.7%
Engineering Major	41.4%	***	13.9%
Hard Sciences Major	6.8%	***	10.1%
Advanced Degree (1=yes)	14.6%	***	6.7%
Expectations			
Expect to have no children	6.6%	***	11.1%
Expect to Marry after 30	9.6%	***	6.1%
Gender Role Orientation	2.20	***	1.95
Expect to work in STEM A	31.0%	***	20.1%
Marital Status and Children			
Married	59.5%	***	65.5%
Number of Children	0.66	***	0.85
First Child is Under 5	19.2%		19.5%
Got Married in T2	6.9%		6.5%
No Longer Married in T2	1.5%		1.6%
Had Child in T2	9.3%		10.3%
Spouse Characteristics			
Spouse works in STEM A	3.1%	***	8.3%
Share of Family Income Earned by Individual	82.4%	***	64.5%
Job Characteristics			
Annual Earnings	$35,533	***	$23,846
Weekly Hours Worked	37.50	***	28.46
Hours worked above 45/week	2.61	***	0.86
Employer Offers Flexible Work Hours	71.0%		69.6%
Hours worked from home	2.13	***	1.40
Firm Size	2864.04	***	1067.95
Parental Leave	67.9%	***	85.2%
Offered Health Care	50.9%	***	42.8%
Working for Gov't	15.0%	***	23.6%
Number of Observations	2,795		1,356

Source: NLSY 1979 Sample of College-educated Individuals who ever work in a STEM A occupation. *** indicates significance at .001 level, ** .05 level, † .10 level

Table 3. Multinomial Regressions for Women in STEM A Occupations

	Block 1			Block 2		
	STEM A, new employer	non-STEM Job	Out of Labor Force	STEM A, new employer	non-STEM Job	Out of Labor Force
Job tenure (in years)	-0.063 †	-0.089 **	-0.109 **	-0.060 †	-0.094 **	-0.117 **
# of Person Years contributed	-0.019	-0.003	0.080 **	-0.021	-0.001	0.086 **
Calendar Year	0.112 **	-0.023	-0.022	0.103 †	-0.022	-0.031
Age	-0.125 †	-0.015	0.122 **	-0.120 †	-0.006	0.163 **
Education						
Biology Major (1=yes)	0.786	-0.212	0.074	0.818	-0.154	0.266
Computer Science Major	0.408	-1.146 ***	-3.013 ***	0.442	-1.193 ***	-3.022 ***
Engineering Major	-1.786 **	-1.431 ***	-1.823 ***	-1.737 **	-1.433 ***	-1.961 ***
Hard Science Major	0.204	-0.886 **	-2.209 ***	0.247	-0.725 **	-1.950 **
Advanced Degree (1=yes)	0.514	1.099 **	0.850 †	0.465	1.168 **	1.159 **
Expectations						
Expect to have no children				0.202	-0.489	-1.137 **
Expect to Marry after 30				-0.012	-0.594	1.322 **
Gender Role Orientation				0.067	0.082	0.497
Expect to work in STEM A				-0.043	-0.090	-0.957 **
Marital Status and Children						
Married						
Number of Children						
First Child is Under 5						
Got Married in T2						
No Longer Married in T2						
Had Child in T2						
Individual Moved in the Last Year						
Spouse Characteristics						
Spouse works in STEM A						
Share of Family Income Earned by Individual						
Number of Observations		984			984	

Source: NLSY 1979 Sample of College-educated Individuals who ever work in a STEM A occupation

Table 3. (continued)

	Block 3						Block 4						
	STEM A, new employer		non-STEM Job		Out of Labor Force		STEM A, new employer		non-STEM Job			Out of Labor Force		
Job tenure (in years)	-0.063	†	-0.094	**	- 0.114	**	-0.053		-0.094	**		-0.042		
# of Person Years contributed	-0.021		0.006		0.091	**	-0.007		-0.046			0.085		
Calendar Year	0.105	**	-0.021		- 0.012		0.106		-0.042			0.210	**	
Age	-0.134	**	-0.006		0.132	**	-0.042		-0.006			-0.029		
Education														
Biology Major (1=yes)	0.758		-0.255		0.110		-30.031	***	-0.449			0.509		
Computer Science Major	0.459		-1.233	***	- 3.225	***	0.263		-0.992	**		-2.182	**	
Engineering Major	-1.686	**	-1.464	***	- 2.070	***	-2.199	**	-1.886	***	-	-2.570	***	
Hard Science Major	0.305		-0.700	**	- 2.000	**	-0.588		-0.812	†		-3.429	***	-
Advanced Degree (1=yes)	0.528		1.218	**	1.173	**	0.481		1.337	**	+	0.970		
Expectations														
Expect to have no children	0.437		-0.501		- 0.852	†	0.321		-0.505			0.133		
Expect to Marry after 30	-0.049		-0.656		1.519	**	0.256		-1.493	**		3.007	**	
Gender Role Orientation	-0.021		0.094		0.536		0.593		0.245			0.357		+
Expect to work in STEM A	-0.129		-0.145		- 0.851	†	0.499		0.277			-0.777		-
Marital Status and Children														
Married	-0.328		0.313		0.314		0.072		0.427			-0.802		
Number of Children	0.264		-0.016		- 0.003		0.064		0.147			0.241		
First Child is Under 5	0.078		0.046		0.729	**	-0.150		0.370			0.746		+
Got Married in T2	0.314		0.412		- 1.108		1.047		0.000			-0.187		
No Longer Married in T2	-1.151		-0.862		-		-0.834		-1.661			0.553		

				0.408									
Had Child in T2	-0.049	-0.493		0.806	**	0.351		-0.463			1.554	**	
Individual Moved in the Last Year						-28.367	***	1.234			2.055	†	
Spouse Characteristics													
Spouse works in STEM A	-0.522	-1.259	**	-1.66	**	-0.159		-1.362	**		-3.430	**	
Share of Family Income Earned by Individual						0.613		0.862	†		-1.733	**	
Job Characteristics													
Annual Earnings						5.92E-06		1.18E-05	**		-1.56E-05		
Hours Worked Up to 45/Week						0.006		-0.027	**		-0.078	***	
Hours Worked above 45/Week						-0.071		0.057	**		0.090		
Indicator for First STEM job						0.000		0.296			-0.173		
Employer offers Flexible work hours						0.251		-0.169			-0.534		
Number of Hours worked at home						0.000		-0.014			-0.012		
Employer Offers Parental Leave						-0.770		0.103			-1.002		
Employer Offers Health Care						0.667		1.057	**	+	2.601	**	+
Missing Health Care information						0.052		0.469			1.552	†	
Number of Employees in Firm						-5.11E-05		6.79E-06			-2.22E-04		
Individual Works for the Government						-0.611		0.146			-0.224		
Number of Observations			984						984				

Source: NLSY 1979 Sample of College-educated Individuals who ever work in a STEM A occupation

Table 4. Multinomial Regressions for Men in STEM A Occupations

	Block 1			Block 2		
	STEM A, new employer	non-STEM Job	Out of Labor Force	STEM A, new employer	non-STEM Job	Out of Labor Force
Job tenure (in years)	-0.181 ***	-0.039 **	-0.237 **	-0.179 ***	-0.046 **	-0.214 **
# of Person Years contributed	-0.009	-0.003	0.047	-0.009	-0.007	-0.014
Calendar Year	0.080 **	-0.019	0.019	0.085 **	-0.028	-0.205
Age	-0.079 **	0.005	-0.014	-0.090 **	0.029	-0.004
Education						
Biology Major (1=yes)	-0.425	0.162	1.873 ***	-0.490	0.318	2.031 ***
Computer Science Major	-0.167	-0.934 ***	-2.444 **	-0.156	-0.938 ***	-2.433 **
Engineering Major	-0.173	-0.775 ***	-1.170 **	-0.144	-0.826 ***	-1.035 **
Hard Sciences Majors	-0.618	-0.290	-0.006	-0.670	-0.146	0.120
Advanced Degree (1=yes)	0.377 †	0.024	-1.474	0.382 †	-0.049	-1.363
Expectations						
Expect to have no children				0.175	-0.310	1.259 **
Expect to Marry after 30				0.088	-0.814 ***	-0.503
Gender Role Orientation				-0.223	0.142	-0.271
Expect to work in STEM A				-0.012	-0.113	-0.350
Marital Status and Children						
Married						
Number of Children						
First Child is Under 5						
Got Married in T2						
No Longer Married in T2						
Had Child in T2						
Individual Moved in the last Year						
Spouse Characteristics						
Spouse works in STEM A						
Number of Observations		2323			2323	

Table 4. (continued)

	Block 3						Block 4							
	STEM A, new employer		non-STEM Job		Out of Labor Force		STEM A, new employer		non-STEM Job			Out of Labor Force		
Job tenure (in years)	-0.178	***	-0.044	**	-0.204	**	-0.170	***	-0.036	†		-0.199	**	
# of Person Years contributed	-0.007		-0.005		0.041		0.009		-0.035	†		0.130		
Calendar Year	0.083	**	-0.030		0.006		0.158	**	-0.030			0.017		
Age	-0.092	**	0.028		-0.043		-0.058		0.013			0.140		
Education														
Biology Major (1=yes)	-0.498		0.328		1.929	***	-0.128		0.651			0.677		
Computer Science Major	-0.176		-0.946	***	-2.547	**	-0.039		-0.777	** **		-2.805	†	
Engineering Major	-0.152		-0.823	***	-1.155	**	-0.090		-0.694	*	-	-1.557	**	
Hard Sciences Majors	-0.681		-0.169		0.025		-1.405		-0.087			-0.091		-
Advanced Degree (1=yes)	0.418	**	-0.016		-1.467	†	0.016		-0.062		+	-1.034		
Expectations														
Expect to have no children	0.123		-0.360		1.238	**	-0.277		-0.373			1.941	†	
Expect to Marry after 30	0.076		-0.835	***	-0.487		0.019		-1.000	**		-0.773		
Gender Role Orientation	-0.216		0.146		-0.317		-0.012		-0.040			-1.491	**	+
Expect to work in STEM A	-0.031		-0.130		-0.302		0.076		0.042			0.465		-
Marital Status and Children														
Married	0.235		0.160		0.463		0.028		0.089			-1.078	†	
Number of Children	-0.024		-0.033		0.101		-0.111		-0.022			0.235		
First Child is Under 5	-0.293		-0.155		-2.366	**	0.251		-0.141			-2.130		+
Got Married in T2	0.079		0.081		0.480		0.385		0.121			-25.401	***	
No Longer Married in T2	0.407		0.572		1.542	†	0.998		0.574			0.826		
Had Child in T2	-0.180		-0.318		1.012		-0.197		-0.351			2.185	**	
Individual Moved in the last Year							0.942		1.552	**		-25.423	***	
Spouse Characteristics														
Spouse works in STEM A	-0.658		-0.421		0.092		0.079		-0.150			1.057		
Share of Family Income Earned by Individual							0.124		-0.128			-1.322		

Job Characteristics							
Annual Earnings		8.6E-06	**	4.1E-06		1.4E-05	†
Hours Worked Up to 45/Week		-0.018		-0.002		-0.041	
Hours Worked above 45/Week		0.007		0.028	**	0.073	**
Indicator for First STEM job		0.330		-0.145		1.327	
Employer offers Flexible work hours		-0.249		-0.023		-0.359	
Number of Hours worked at home		-0.010		0.017		-0.103	
Employer Offers Parental Leave		-0.245		-0.198		-0.636	
Employer Offers Health Care		-0.066		-0.137	+	-1.230	+
Missing Health Care information		-0.095		0.081		-0.043	
Number of Employees in Firm		-4.71E-05	**	-2.53E-05		-3.10E-05	
Individual Works for the Government		-0.251		0.289		-0.168	
Number of Observations	2323			2323			

Source: NLSY 1979 Sample of College-educated Individuals who ever work in a STEM A occupation