



The Impacts of Marriage on Perceived Academic Career Success: Differences by Gender and Discipline

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ABSTRACT

This study examines perceptions of how marriage impacts two aspects of academics' career success in STEM and non-STEM fields: professional productivity and professional mobility. We pose three research questions. (1) How does marriage shape women's and men's perceptions of academic career success? (2) How do perceptions of career gains differ for women and men in STEM and non-STEM fields? and (3) How does parenthood impact these perceptions? We use unique data from a random sample of academics in thirteen U.S. institutions. Findings indicate that gender, individual, family and institutional characteristics, and professional productivity form faculty's perceptions of professional success. Women in both STEM and non-STEM fields report higher perceptions of perceived gains in professional productivity and involvement due to marriage compared to their male counterparts. However, for academics in both disciplines, women perceive less professional mobility gains from their marriage than do men. Being a parent is associated with the view that marriage negatively affects success in academia. Being married to an academic partner is associated with the perception that marriage positively impacts professional productivity, but negatively impacts mobility for those in both STEM and non-STEM disciplines.

KEYWORDS

marriage; academics; perceptions; career; gains; loss; success; women; STEM; non-STEM



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INTRODUCTION

Researchers have produced compelling evidence that marriage impacts academic careers. Since most marriages are between two people at a similar education level (Blossfeld & Timm, 2003; Kalmijn, 1998), the increase in the number of academics¹ partnered with other academics in the United States is not surprising. This increase in academic dual-career couples is partly due to significant increases in the number of women earning Ph.D.s. In the 2009-2010 academic year women earned 37 percent of the Ph.D.s in STEM disciplines and comprised 31 percent assistant, 22 percent associate and 13 percent full professor in STEM disciplines in the 2011-2012 academic year (Carr, 2013). One reason for women's underrepresentation in U.S. academia may be what others have called the "two-body problem". Roughly 36 percent of academics have academic partners (Schiebinger, Henderson, & Gilmartin, 2008). Women in STEM disciplines are more likely than their male counterparts to be partnered with another academic; 59 percent of STEM female faculty were married to another STEM male faculty compared to just 17 percent of STEM male faculty (Fox, 2005; Schiebinger et al., 2008). Thus, the "two-body problem" likely has a disparate influence on academics in and out of STEM disciplines in the U.S. system of higher education.

To date, dual-career research has examined the extent to which marital and parental status contribute to the employment status (Perna, 2001; Correll, Bernard & Palk, 2007; Frehill, 2012), salaries (Barbezat, 1992; Bellas, 1992; Toutkoushian, 1998), research productivity (Ward & Wolf-Wendall, 2004; Bellas & Toutkoushian, 1999; Creamer, 1998), and the effect of spousal support on job satisfaction and job stress (Bures et al., 2011) of U.S. college and university faculty. We add to our understanding of the realities of academic dual couples by examining the perceptions academics have of the way marriage impacts their careers. Such a focus is warranted because it may shed light on mechanisms whereby U.S. institutions can attract and retain dual career couples, a strategy that may be especially useful in retaining and attracting STEM women (McCluskey, Byington, Cowan, & Kmec, 2012). Our study contributes not only to academic policy conversations, but also to the gender and academia literature more broadly. We pose three research questions. First, how does marriage shape women's and men's perceptions of academic career success? Second, how do perceptions of career gains differ for women and men in STEM and non-STEM fields? Third, how does parenthood impact these perceptions? In the remainder of this section, we describe several factors that impact faculty member's perceptions of career success due to marriage.

The Role of Gender

Faculty gender is likely to impact how one sees the connection between marriage and career success. Since STEM women are more likely than other faculty to be part of an academic couple (Fox, 2005), negative career consequences for academic couples will fall disproportionately on STEM women (Ceci & Williams,

2011; Correl, Bernard & Paik, 2007; Fuegen, Biernat, Haines & Deaux, 2004). Scholars have identified the structure of the scientific workplace, which forces women to choose between work and family (Crittenden, 2002; Hochschild & Machung, 1989; Mason & Goulden, 2002; Williams, 2000), as one of the reasons why marriage decreases women's but increases men's odds of attaining an academic job. Compared to a married man, a married woman has 12 percent lower odds of getting an academic job (Wolfinger, Mason, & Goulden, 2008). Further, women are in lower ranks, earn lower salaries, have heavier teaching loads and less research support, and serve on more committees than do their male colleagues (August & Waltman, 2004; Gander, 1999; Park, 1996; Stack, 2004).

The Role of Children

Being a parent, especially a mother, brings to the forefront an academics' role as a nurturer and increases expectations of family caregiving responsibilities (Ridgeway & Correl, 2004). Considerable research has investigated the relationship between parenthood and academics' productivity, particularly among STEM female faculty, but the findings of these studies are mixed: the number of children was positively related to research productivity, and women with preschool children exhibited higher productivity than women without children or with school-age children (Fox, 2005). Others have found short-term or long-term negative impacts on women's academic productivity (Hunter & Leahey, 2010; Mason & Goulden, 2002; Wolfinger et al., 2008). While both fathers and mothers experience work and family conflict, the magnitude of perceived interference of work with family life is greater for women than for men (Fox, Fonseca & Boa, 2011). Parenthood requires a great deal of time, time that could be devoted to the career pursuits. For example, Kmec (2013) found that STEM mothers reported higher perceptions of working harder on the job than fathers across all fields even when they had similar rank and devoted similar amounts of time to both job and home tasks. Thus, parenthood (especially among women) may negatively impact the extent to which an academic thinks that his or her marriage influences career success.

The Role of Academic Discipline

It is possible that membership in a STEM field will impact how one views marriage's impact on career success, and that this view will differ for women and men. STEM fields may have a masculine work culture, one in which professional "success" means the display of masculine characteristics or behaviors (Chesler & Chesler, 2002; Gunter, 2009; Rhoton, 2011) and one that views marriage as an unnecessary interruption of work (Fox et al., 2011). Thus, all STEM academics may feel that anything taking them away from science is a detriment to their career. STEM women may feel especially that marriage leads to career losses because as outsiders in a masculine field, professional success and being taken seriously is only possible by downplaying or hiding family caregiving (Ong, 2005).

Additional Factors Affecting Perceptions of Career Success

Administrative duties

Administrative duties often reflect a certain amount of success and stature for faculty although women must often demonstrate greater competence than do men in similar leadership roles (Ridgeway, 2001). The perception of good leadership

often defaults to one which values masculine characteristics such as total devotion to the work with a corresponding lack of emotion (Acker, 1998). This devotion may remove faculty from research and in turn reduce perceptions of career success. Stereotypes of competence and productivity are also more salient in STEM contexts in which success is already defined as masculine (Martell & DeSmet, 2001).

Career Primacy

Whether one's career takes primacy over their partner's career should influence perceived career success such that career primacy may be linked to greater success. According to a survey of accounting academics, a high priority on one's profession positively contributes to academics' mobility, rank and salary at middle career (Kirchmeyer, 2006). Women are likely to make career changes to accommodate their husband's job; 31 percent of married women reported that they would make career concessions for their husband's career compared to only 21 percent of men who would do the same for their wife's career (Martinez et al., 2007). Marriage and children can affect women's work and family priorities, but they can affect men's less or not at all.

Dual hire couples

Being part of a dual hire is also likely to impact how one views the marriage-career success relationship. Given that marriage increases publication rates for female academics (Astin & Davis, 1985; Cole & Zuckerman, 1984), marriages' negative effect on women's job procurement likely has more to do with dual-career constraints than with research productivity. Since female academics are far more likely than male academics to be married to academic spouses (Jacobs & Winslow, 2004), marriage probably reduces the rate at which women get tenure-track positions by imposing geographic constraints on dual-career couples (Xie & Shauman, 2003; Stack, 2004).

Institutional Factors

The type of U.S. university (public/private) in which an academic works may impact on how career success is perceived. Public universities are often seen as less prestigious than are private universities. Private universities have greater latitude in developing supportive work-life policies and flexible hiring practices than do public universities which are constrained by state policies (Riskin et al., 2007; Schiebinger et al., 2008). In public universities, money to accommodate academic partners may be limited and marriage may place a greater burden on academic couples than in private universities. Formal dual-career policies at the university may ameliorate some of the stress related to balancing two academic careers and career success; even if an academic does not take advantage of the formal policy, the presence at least signals the university pays attention to dual career issues.

DATA

To test our research questions, we draw on the 2006/2007 Managing Academic Careers Survey Dataset designed and administered by Stanford University's Michelle R. Clayman Institute for Gender Research (MACS). Roughly 9,000 full-time faculty members from 13 leading U.S. research universities participated in this online survey dealing with, among other things, satisfaction, productivity,

households, mobility and perceptions of faculty about academic life². We restrict analyses to full-time, tenure-track faculty who were either married or cohabitating at the time of the survey.

Dependent variables

To measure faculty members' perceptions of how their marriage impacts their career success, we use responses to the questions: *In your career overall, do you feel that you have gained or lost in the following areas as a result of your marriage/partnership?* (1) research productivity; (2) time to participate in profession (socializing with faculty, attending conferences); (3) employment status; (4) level of current position; (5) quality of institution; (6) salary; (7) relationships with other faculty in your department; and (8) professional mobility. The responses to each category were coded: "1 = Major Loss", "2 = Loss", "3 = Neither Gain or Loss", "4 = Gain" and "5 = Major Gain".

Based on principal factor analysis results³ we combined only four questions above into two measures which we call: (1) *professional productivity and involvement* (questions 1 and 2); and (2) *employment context* (questions 3 and 4). Compared with other questions mentioned above, faculty's perceptions of perceived career gains in professional productivity and involvement, and in professional mobility, are directly affected by marriage and parenthood. Previous research has shown that the greater parenting and marital responsibilities of women relative to men are one of the main factors explaining the gender gap in research productivity. Women in sciences who are married with children are 35 percent less likely to enter a tenure track position after receiving a Ph.D. than married men with children and they are 27 percent less likely than their male counterparts to achieve tenure upon entering a tenure track job. By contrast, single women without young children are roughly as successful as married men with children in attaining a tenure track job, and a little more successful than married women with children in achieving tenure. Married women without children also do not fare quite as well as men (Goulden et al., 2009). Further, employed, married women are less geographically mobile than men (Cole & Zuckerman, 1984), Xie & Shauman, 1998, 2003; Stack, 2004). Thus, the current study provides some new evidence on how marriage contributes to academics' perceptions of success in professional productivity and mobility. Table 1 summarizes coding of independent and control variables.

METHOD OF ANALYSIS

Given the ordinal nature of the dependent variables, we estimated ordered logistic regression models. Tables 3-6 report coefficients and odds ratios for STEM⁴ versus non-STEM respondents. We estimated a series of three models for each outcome: model 1 includes both women and men; model 2 describes results for women; while model 3 presents results for men. We tested robustness of results with exclusion and inclusion of dichotomous variables for 13 universities and we found that the effects of our variables of interest and other independent variables remained unchanged.

Table 1: Coding of Variables in Analysis

Name of the variable	Description
Dependent variables	
Marriage has led to gains in professional productivity and involvement	1 = Major Loss; 2 = Loss; 3 = Neither Gain or Loss; 4 = Gain; 5 = Major Gain
Marriage has led to gains in professional mobility	1 = Major Loss; 2 = Loss; 3 = Neither Gain or Loss; 4 = Gain; 5 = Major Gain
Female	1 = female, 0 = otherwise
Parenthood	1 = respondent reports that he/she makes a daily contribution to parenting, 0 = otherwise (see notes below)
Academic Partner	1 = respondent's partner works in academia, 0 = otherwise
Hired through dual-career hire policy	1 = respondent was hired through a dual-hire policy, 0 = otherwise
Career primacy	1 = respondent's career is primary, 0 = partner's career is primary or both partners' career is equal
Controls	
STEM discipline	1 = in STEM discipline, 0 = otherwise
U.S. citizen	1 = U.S. citizen, 0 = otherwise
Salary	average annual salary
Rank	dichotomous variables for Assistant, Associate and Full Professors
Administrator	1 = respondent holds an administrative position, 0 = otherwise
Age	age of the respondent (in years)
Productivity	number of articles, books, manuals, monographs, edited books, patents and computer software products published by the respondent over the course of his/her career
Gains from collegial relationship	1 = if the respondent identifies gains or major gains in relationships with other faculty, 0 = otherwise
Institutional Tenure	number of years spent at the current institution
Public Institution	1 = if public institution, 0 = otherwise
Dual-hire policy at the university	1 = if the institution has one of the following formal dual-hire policy in practice: written hiring and retention policies; dual-career website resource and dual-career office staff, 0 = otherwise
University	dichotomous variables for university 1-13

NOTES: Due to survey administration error, we cannot use the question asking directly about presence of children in the home. Instead, we create a proxy for parenthood by coding as parents anyone who responded that they have at least some daily contributions to parenting.

RESULTS

Descriptive Results

Table 2 provides descriptive statistics for the entire sample and for sub-samples determined by respondent's gender and discipline, and the t-statistic from the test of mean differences by gender.

Turning first to the dependent variables, both STEM and non-STEM women and men report similar levels of gains in professional productivity and involvement due to their marriage. Non-STEM women and men differ significantly in their perceptions of how their marriage impacts professional productivity and involvement. On average, academics feel neutral (indifferent) with regard to career gains in professional productivity and involvement because of their marriage ($\bar{x}=3.33$).

Next, women from STEM and non-STEM disciplines have lower levels of perceived career gains in professional mobility due to marriage, compared to their male colleagues ($p<.01$). In general, female academics' perceptions of perceived career success due to marriage are lower than male academics'.

To give readers a better sense of respondent's distribution across the outcome measures, Figures 1 and 2 illustrate the percentage of men and women who report career gains and losses in professional involvement and productivity, and mobility due to marriage. Figure 1 shows that over 30 percent of STEM and non-STEM academics see career success in professional productivity and involvement whereas Figure 2 shows that over 30 percent of STEM and non-STEM faculty feel declines in professional mobility as the result of marriage. The proportion of STEM men reporting career gains in professional productivity is slightly higher than the proportion of women in STEM. A similar pattern is observed for non-STEM academics. Importantly, the majority of STEM and non-STEM women report lower perceptions of career success in professional mobility due to marriage. Thus, Figures 1 and 2 illustrate how marriage shapes faculty's perceived gains in professional productivity and mobility and how perception levels of academics differ across measures of professional success. Multivariate analyses presented in the next section shed light on what drives these perceptions.

Turning now to the primary independent variables, Table 2 shows that about 38 percent of sampled faculty members are female. Furthermore, 61 percent of academics reported having parenthood commitments along with other responsibilities, and 32 percent of faculty members had an academic spouse at the time of the survey. Almost 11 percent of faculty members were hired through dual career policy, and about 53 percent of respondents consider their career primary over their spouses' career. About 32 percent of the whole sample (both men and women) work in a STEM discipline.

Looking now to the sub-samples of STEM and non-STEM academics, 49 percent of STEM and 40 percent of non-STEM female faculty were married to academics compared to 26 percent of male academics in both fields. About 20 percent of STEM female academics were hired through a dual-career hire policy compared to 8 percent of male faculty. Among non-STEM academics, 11 percent of women and 7 percent of men were recruited through a formal dual-career hire policy. Women are over-represented in lower ranks and underrepresented in the highest academic ranks. Women from non-STEM disciplines are more likely to identify their work as administrative activities than women from STEM disciplines. Furthermore, female academics are likely to publish less than men: over their entire career, men have published nearly twice as much as women. As for institutional tenure, on average, a

female faculty's experience is about 10 years at her current institution whereas male faculty's experience is 14 or 15 years.

Figure 1. Distribution of faculty's perceptions of career gains and losses in research productivity and involvement due to marriage

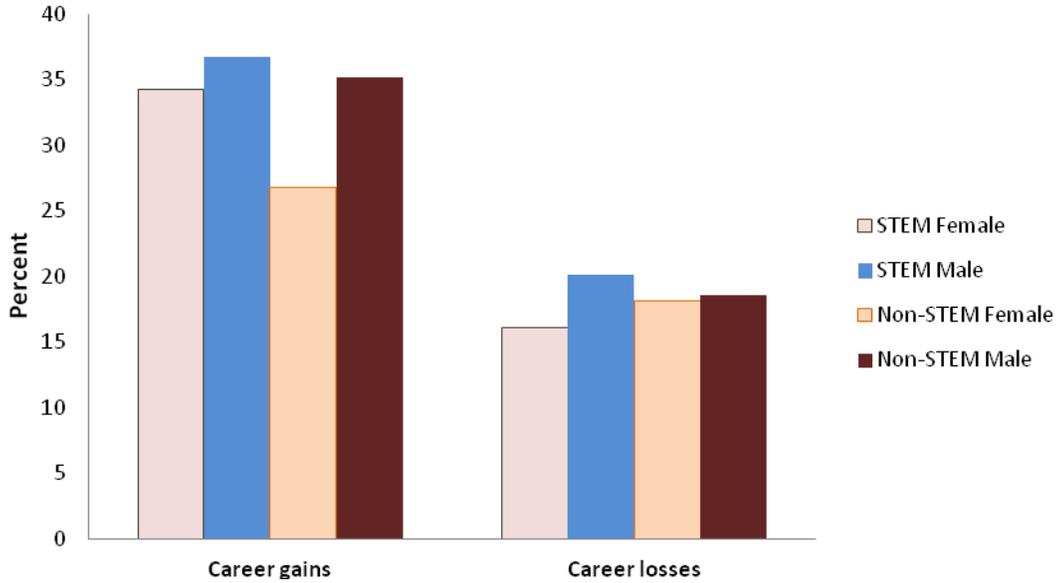


Figure 2. Distribution of faculty's perceptions of career gains and losses in professional mobility due to marriage

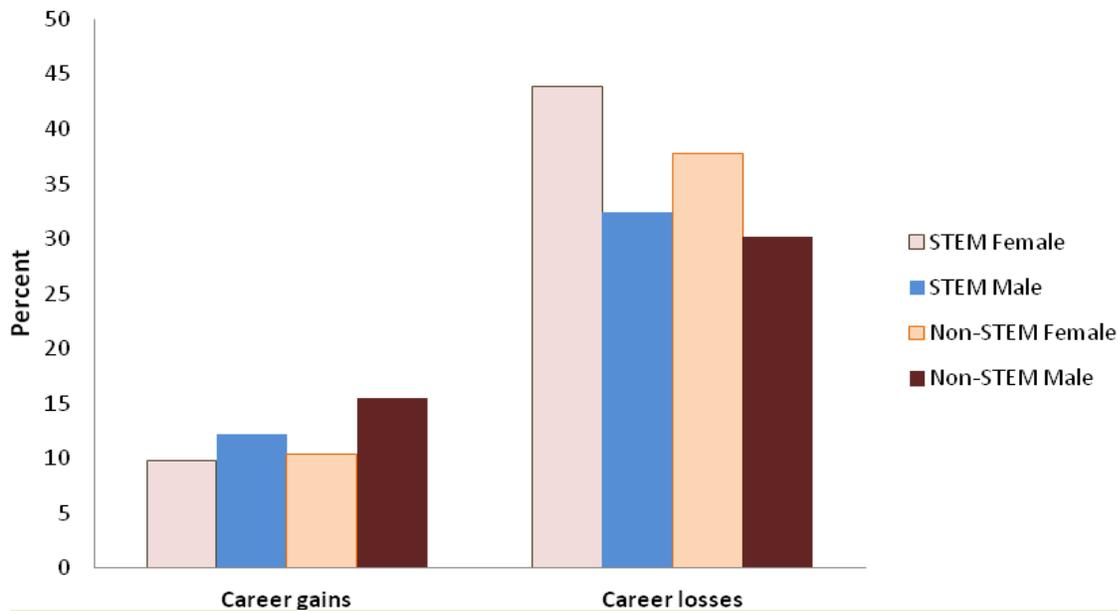


Table 2: Summary Statistics for Model Variable, by Gender and Discipline (mean (st. dev))

Variable	STEM			Non-STEM	
	All (No=7748)	Female (No=705)	Male (No=1786)	Female (No=2243)	Male (No=3010)
<i>Dependent variable:</i>					
Marriage has led to gains in professional productivity and involvement	3.33 (0.89)	3.40 (0.89)	3.31 (0.89)	3.20* (0.90)	3.30* (0.89)
Marriage has led to gains in professional mobility	2.70 (0.97)	2.45* (1.00)	2.75* (0.91)	2.55* (1.01)	2.84* (0.93)
<i>Independent variable:</i>					
Female	0.38 (0.49)				
Parenthood	0.61 (0.49)	0.51* (0.50)	0.56* (0.50)	0.52* (0.50)	0.58* (0.56)
Academic partner	0.32 (0.47)	0.49* (0.50)	0.26* (0.44)	0.40* (0.49)	0.26* (0.44)
Hired through dual-career hire policy	0.11 (0.32)	0.20* (0.40)	0.08* (0.26)	0.11* (0.31)	0.07* (0.26)
Career primacy	0.53 (0.50)	0.27* (0.44)	0.62* (0.49)	0.25* (0.43)	0.59* (0.49)
<i>Controls:</i>					
STEM discipline	0.32 (0.47)				
U.S. citizen	0.86 (0.35)	0.83 (0.37)	0.81 (0.39)	0.88 (0.32)	0.87 (0.34)
Log salary	11.57 (0.52)	11.38* (0.44)	11.59 * (0.41)	11.44* (0.52)	11.71* (0.56)
Assistant	0.26 (0.44)	0.36* (0.48)	0.21* (0.41)	0.33* (0.47)	0.23* (0.42)
Associate	0.24 (0.43)	0.21 (0.40)	0.20 (0.40)	0.28* (0.45)	0.24* (0.43)
Full professor	0.26 (0.44)	0.23* (0.42)	0.37* (0.48)	0.16* (0.36)	0.29* (0.45)
Admin	0.27 (0.44)	0.19* (0.39)	0.22* (0.41)	0.28* (0.45)	0.31* (0.46)
Age	49.09 (10.36)	44.89* (9.56)	49.90* (10.89)	47.27* (9.35)	50.94* (10.44)
Age ²	2517.36 (1044.94)	2160.95* (956.09)	2577.08* (1125.22)	2348.08* (943.01)	2674.01* (1089.46)

Productivity	47.28 (67.18)	37.07* (50.51)	68.26* (81.93)	26.11* (37.32)	49.89* (70.42)
Gains from collegial relationship	0.27 (0.44)	0.20* (0.40)	0.31* (0.46)	0.21* (0.41)	0.31* (0.46)
Institutional tenure	12.45 (10.47)	9.66* (8.35)	14.93* (11.46)	9.80* (8.36)	13.60* (11.13)
Institutional tenure ²	264.70 (388.33)	163.09* (252.50)	353.99* (452.68)	165.86* (263.45)	308.62* (427.89)
Public university	0.64 (0.48)	0.62* (0.49)	0.57* (0.50)	0.69* (0.46)	0.65* (0.48)
Dual-hire policy at the university	0.16 (0.37)	0.18 (0.39)	0.20 (0.40)	0.14 (0.35)	0.16 (0.36)

Note: * $p < .01$ t-statistic on gender difference

Multivariate Results

Perceptions of Gains in Professional Productivity and Involvement due to Marriage

Tables 3 and 4 present the results of the analysis for determinants of perceptions of the impact of marriage on perceived career gains in professional productivity and involvement for all academics, and by gender (results for STEM academics appear in Table 3 and those for non-STEM academics in Table 4). We organize discussion of results by discipline, emphasizing within discipline gender differences throughout.

STEM disciplines

Results drawing on the full sample (Table 3, Column 1) reveal that STEM female academics perceive *greater* career gains in professional involvement and productivity as the result of marriage than do their male colleagues. Parenthood has a negative effect on a faculty member's perceived gains in professional participation, implying a significant parenthood disadvantage for faculty in STEM fields. Having an academic partner, being hired through dual career policy and career primacy are not related to faculty's perceptions of career success in productivity and involvement. Being a U.S. citizen reduces perceptions of perceived career success in professional productivity due to marriage for faculty members. The number of publications over one's career is positively related to the outcome, suggesting as career productivity levels increase individuals report career gains in professional productivity and involvement due to marriage. Further, perceived gains from collegial relationships positively affect the outcome indicating, to some extent, that academics who stress the importance of good working relationships with colleagues have higher perceptions of gains in professional productivity due to their own marriage than those who deem this factor unimportant. We note that STEM faculty members in universities with formal dual career hiring policies have lower perceptions of perceived career success in productivity and professional involvement due to marriage than those institutions without such a policy.

Table 3: Results from Ordered Logistic Regression predicting Professional Productivity and Involvement, STEM disciplines

	All		Female		Male	
	b(se)	Odds Ratio	b(se)	Odds Ratio	b(se)	Odds Ratio
Female	0.509*** (0.10)	1.664				
Parenthood	-0.371*** (0.09)	0.690	-0.314* (0.16)	0.730	-0.389*** (0.10)	0.678
Academic partner	0.168 (0.10)	1.183	0.251 (0.19)	1.286	0.133 (0.13)	1.142
Hired through dual career policy	0.156 (0.14)	1.168	0.125 (0.22)	1.133	0.109 (0.19)	1.115
Career primacy	0.080 (0.09)	1.083	0.159 (0.17)	1.173	0.025 (0.11)	1.026
US citizen	-0.313** (0.11)	0.732	0.079 (0.21)	1.082	-0.492*** (0.13)	0.612
Log salary	0.480*** (0.13)	1.615	0.439 (0.24)	1.552	0.526*** (0.15)	1.693
Associate	-0.164 (0.11)	0.849	-0.176 (0.22)	0.839	-0.167 (0.13)	0.846
Full professor	-0.038 (0.11)	0.962	0.349 (0.24)	1.418	-0.154 (0.13)	0.857
Admin	-0.056 (0.10)	0.945	-0.189 (0.20)	0.828	0.003 (0.12)	1.003
Productivity	0.003*** (0.00)	1.003	0.003 (0.00)	1.003	0.002*** (0.00)	1.002
Gains from collegial relationship	1.397*** (0.09)	4.041	1.428*** (0.19)	4.172	1.415*** (0.11)	4.116
Age	-0.011 (0.04)	0.989	0.020 (0.08)	1.020	-0.015 (0.05)	0.986
Age ²	0.000 (0.00)	1.000	0.000 (0.00)	1.000	0.001 (0.00)	1.001
Institutional tenure	-0.042* (0.02)	0.959	-0.045 (0.04)	0.956	-0.038* (0.02)	0.963
Institutional tenure ²	0.001 (0.00)	1.001	0.001 (0.00)	1.001	0.001 (0.00)	1.001
Public university	-0.004 (0.22)	0.996	-0.251 (0.41)	0.778	0.083 (0.27)	1.086
Dual hire policy at the university	-0.220* (0.10)	0.803	-0.261 (0.19)	0.771	-0.205 (0.12)	0.815

Control for institution	Yes	Yes	Yes
cut1	0.760 (1.71)	0.756 (3.33)	1.086 (2.05)
cut2	4.227* (1.69)	3.927 (3.30)	4.681* (2.02)
cut3	6.495*** (1.69)	6.124 (3.30)	7.007*** (2.03)
cut4	8.528*** (1.44)	8.149* (2.69)	9.071*** (1.74)
No of observations	2335	668	1667
Chi-square	481.688	108.689	402.179
Pseudo R ²	0.080	0.063	0.094

Note: *p<.10; **p<.05; ***p<.01. Robust standard errors are in parentheses

The last two columns of Table 3 provide results of perceived gains in professional productivity and involvement due to marriage for female and male STEM academics. Parenthood decreases the perceived career gains due to marriage for both women and men. Women with U.S. citizenship see a loss in professional productivity and involvement due to marriage. Salary and productivity are positively related to the outcome among STEM women. Perhaps monetary incentives increase the performance of faculty and this in turn impacts their productivity as well.

Non-STEM disciplines

Looking now to the results for faculty in non-STEM disciplines (Table 4), analyses of the full sample (Column 1) reveal that compared to their male colleagues, female academics are more likely to report greater perceived gains in their profession due to marriage. Parenthood reduces views of career success in professional productivity and involvement due to marriage for both Non-STEM women and men. Marriage to an academic partner or using a dual-career hire policy during job negotiations is positively linked to perceptions of career success in professional involvement due to marriage. The positive coefficient for career primacy suggests that individuals whose career is privileged in the marriage, report career gains in professional productivity. This result most likely reflects the nature of academic career and individuals; those who want to progress through the ranks quickly are more likely to focus on career-related endeavors such as producing publications. Next, perceived levels of gains in professional involvement due to marriage are positively affected by publications and collegial relationship, net of controls.

We observe that all significant effects on the outcome variable reported in column 1 have remained the same throughout the entire analysis shown in columns 2 and 3 controlling for female and male sub-samples. The only difference we found in results was that male faculty members in public universities have significantly higher perceptions of perceived career success in productivity due to marriage than their colleagues from a private university, and also comparable to their female counterparts.

Table 4: Results from Ordered Logistic Regression predicting Professional Productivity and Involvement, Non-STEM disciplines

	All		Female		Male	
	b(se)	Odds Ratio	b(se)	Odds Ratio	b(se)	Odds Ratio
Female	0.135* (0.06)	1.144				
Parenthood	-0.403*** (0.06)	0.668	-0.547*** (0.09)	0.578	-0.276*** (0.08)	0.759
Academic partner	0.249*** (0.07)	1.283	0.259* (0.10)	1.295	0.210* (0.10)	1.234
Hired through dual career policy	0.378*** (0.10)	1.460	0.391** (0.14)	1.479	0.387* (0.15)	1.473
Career primacy	0.193** (0.06)	1.214	0.330*** (0.09)	1.391	0.055 (0.08)	1.056
U.S. citizen	-0.260** (0.09)	0.771	0.014 (0.13)	1.014	-0.472*** (0.11)	0.624
Log salary	0.063 (0.06)	1.065	0.077 (0.10)	1.080	0.024 (0.08)	1.025
Associate professor	-0.063 (0.07)	0.939	0.056 (0.11)	1.057	-0.151 (0.10)	0.860
Full professor	0.067 (0.08)	1.069	0.122 (0.15)	1.130	0.009 (0.10)	1.010
Admin	0.087 (0.06)	1.091	0.007 (0.10)	1.007	0.160 (0.08)	1.174
Productivity	0.003*** (0.00)	1.003	0.005*** (0.00)	1.005	0.003*** (0.00)	1.003
Gains from collegial relationship	1.414*** (0.07)	4.112	1.352*** (0.11)	3.864	1.473*** (0.08)	4.361
Age	-0.047 (0.03)	0.954	-0.035 (0.05)	0.966	-0.031 (0.04)	0.969
Age ²	0.001* 0.00	1.001	0.001 0.00	1.001	0.001 0.00	1.001
Institutional tenure	-0.005 (0.01)	0.995	-0.010 (0.02)	0.990	0.000 (0.01)	1.000
Institutional tenure ²	0.000 0.00	1.000	0.000 (0.00)	1.000	0.000 0.00	1.000
Public university	0.271 (0.15)	1.312	-0.398 (0.24)	0.672	0.719*** (0.19)	2.052
Dual hire policy at the university	0.090 (0.08)	1.094	-0.026 (0.12)	0.974	0.154 (0.10)	1.167
Control for institution	Yes		Yes		Yes	

cut1	-4.344*** (0.97)	-4.339** (1.56)	-4.262*** (1.26)
cut2	-1.309 (0.96)	-1.409 (1.55)	-1.117 (1.25)
cut3	1.050 (0.96)	0.957 (1.55)	1.271 (1.25)
cut4	2.952** (0.96)	2.738 (1.55)	3.287** (1.25)
No of observations	4845	2078	2767
Chi-square	872.124	331.637	590.079
Pseudo R ²	0.070	0.062	0.083

Note: *p<.10; **p<.05; ***p<.01. Robust standard errors are in parentheses

Perception of Gains in Professional Mobility due to Marriage

STEM disciplines

The results in the first column of Table 5 reveal that female and male academics have different views about how their marriage shapes professional mobility; STEM married women have lower perceptions of career gains in professional mobility due to their marriage than do married men in STEM fields. Furthermore, parenthood reduces perceptions of gains in professional mobility due to marriage for faculty members. The effect of having an academic partner on this outcome is significant and negative for STEM academics, a result that may imply that STEM married faculty are constrained by family commitments and their spouse's career. We observe that the career primacy and productivity variables are positively related to gains in mobility due to marriage. Institutional tenure is negatively related to faculty member's perceptions of gains in professional mobility. Finally, academics from public universities report higher net levels of perceived success in professional mobility due to marriage than those in private institutions.

Table 5: Results from Ordered Logistic Regression predicting Professional Mobility, STEM disciplines

	All		Female		Male	
	b(se)	Odds Ratio	b(se)	Odds Ratio	b(se)	Odds Ratio
Female	-0.298** (0.10)	0.742				
Parenthood	-0.243** (0.09)	0.785	-0.281 (0.16)	0.755	-0.224* (0.11)	0.799
Academic partner	-0.364*** (0.11)	0.695	-0.301 (0.19)	0.740	-0.392** (0.13)	0.676
Hired through dual career policy	-0.132 (0.14)	0.876	-0.160 (0.21)	0.852	-0.184 (0.20)	0.832

Couple employed in the same discipline	-0.161 (0.11)	0.851	-0.113 (0.17)	0.893	-0.155 (0.14)	0.856
Career primacy	0.471*** (0.09)	1.602	0.350* (0.17)	1.420	0.510*** (0.11)	1.666
U.S.citizen	-0.203 (0.11)	0.817	-0.383 (0.20)	0.682	-0.166 (0.13)	0.847
Log salary	0.172 (0.12)	1.188	0.439 (0.24)	1.552	0.113 (0.15)	1.120
Associate professor	0.132 (0.11)	1.141	0.307 (0.21)	1.360	0.057 (0.14)	1.059
Full professor	0.036 (0.11)	1.036	0.438 (0.24)	1.549	-0.091 (0.13)	0.913
Admin	0.017 (0.10)	1.017	-0.023 (0.20)	0.977	0.064 (0.12)	1.066
Productivity	0.002** (0.00)	1.002	-0.003 (0.00)	0.997	0.002*** (0.00)	1.002
Age	-0.026 (0.04)	0.975	-0.055 (0.09)	0.947	-0.005 (0.05)	0.995
Age ²	0.001 0.00	1.001	0.001 (0.00)	1.001	0.000 0.00	1.001
Institutional tenure	-0.060*** (0.02)	0.942	-0.054 (0.04)	0.948	-0.053** (0.02)	0.948
Institutional tenure ²	0.001 0.00	1.001	0.000 (0.00)	1.000	0.000 0.00	1.000
Public university	0.776*** (0.22)	2.173	0.462 (0.40)	1.587	0.933*** (0.27)	2.542
Dual hire policy at the university	-0.074 (0.10)	0.929	0.100 (0.19)	1.105	-0.150 (0.12)	0.861
Control for institution	Yes		Yes		Yes	
cut1	-0.074 (1.69)		2.403 (3.38)		-0.214 (2.02)	
cut2	1.905 (1.69)		4.225 (3.39)		1.920 (2.02)	
cut3	4.299* (1.69)		6.194 (3.39)		4.487* (2.02)	
cut4	5.425** (1.69)		7.456* (3.39)		5.574** (2.03)	
No of observations	2335		667		1668	
Chi-square	249.68		60.941		170.521	
Pseudo R ²	0.041		0.033		0.041	

Note: *p<.10; **p<.05; ***p<.01. Robust standard errors are in parentheses

The last two columns in Table 5 present results separately for women and men. Interestingly, only fatherhood — not motherhood — is linked to lower perceptions of mobility due to marriage. For men, then, it appears that marriage with children might restrict their movement for better opportunities whereas for women, motherhood does not change what they may already view as limited mobility prospects (due to being simply married) in STEM fields. Productivity appears positively significant for men but non-significant for women in STEM fields. For STEM male academics, employment in a public university is associated with higher levels of perceived gains in professional mobility than women in the same discipline.

Table 6: Results from Ordered Logistic Regression predicting Professional Mobility, Non-STEM disciplines

	All		Female		Male	
	b(se)	Odds Ratio	b(se)	Odds Ratio	b(se)	Odds Ratio
Female	-0.298*** (0.06)	0.742				
Parenthood	-0.289*** (0.06)	0.749	-0.310*** (0.09)	0.733	-0.286*** (0.08)	0.751
Academic partner	-0.189** (0.07)	0.828	-0.242* (0.10)	0.785	-0.148 (0.10)	0.862
Hired through dual career policy	-0.128 (0.10)	0.880	0.076 (0.14)	1.079	-0.382* (0.15)	0.682
Couple employed in the same discipline	-0.032 (0.07)	0.968	0.085 (0.10)	1.089	-0.138 (0.09)	0.871
Career primacy	0.676*** (0.06)	1.965	0.747*** (0.09)	2.110	0.626*** (0.08)	1.870
U.S. citizen	-0.009 (0.08)	0.992	-0.003 (0.13)	0.997	-0.017 (0.11)	0.983
Log salary	-0.038 (0.06)	0.963	-0.003 (0.10)	0.997	-0.079 (0.08)	0.924
Associate professor	-0.042 (0.07)	0.959	0.065 (0.11)	1.068	-0.104 (0.10)	0.901
Full professor	0.067 (0.08)	1.070	0.148 (0.14)	1.160	0.044 (0.10)	1.045
Admin	0.190** (0.06)	1.209	0.078 (0.10)	1.081	0.288*** (0.08)	1.333
Productivity	0.001 0.00	1.001	0.001 (0.00)	1.001	0.000 (0.00)	1.000
Age	-0.060* (0.03)	0.942	0.038 (0.05)	1.039	-0.108** (0.04)	0.897
Age ²	0.001**	1.001	0.000	1.000	0.001***	1.002

	0.00		0.00		0.00	
Institutional tenure	-0.066*** (0.01)	0.937	-0.074*** (0.02)	0.929	-0.060*** (0.01)	0.941
Institutional tenure ²	0.001***	1.001	0.001* (0.00)	1.001	0.001* (0.00)	1.001
Public university	0.184 (0.15)	1.202	0.021 (0.23)	1.021	0.281 (0.19)	1.325
Dual hire policy at the university	0.033 (0.08)	1.034	0.052 (0.12)	1.053	0.013 (0.10)	1.013
Control for institution	Yes		Yes		Yes	
cut1	-3.786*** (0.96)		-0.874 (1.51)		-5.516*** (1.26)	
cut2	-1.897* (0.95)		0.865 (1.51)		-3.408** (1.26)	
cut3	0.333 (0.95)		2.88 (1.51)		-1.025 (1.25)	
cut4	1.481 (0.96)		3.963** (1.51)		0.17 (1.25)	
No of observations	4835		2077		2758	
Chi-square	498.797		165.972		262.385	
Pseudo R ²	0.038		0.029		0.037	

Note: *p<.10; **p<.05; ***p<.01. Robust standard errors in parentheses

Non-STEM disciplines

Looking now to results of the full sample of non-STEM academics in Table 6, we observe that respondent's gender, parenthood status, and having an academic partner shape perceptions of how marriage contributes to professional mobility. Female academics are less likely than their male counterparts to perceive career gains in professional mobility from marriage. Parenthood decreases the perception levels of faculty members. The results may suggest that academics' perceptions of perceived career gains in professional mobility are affected by the demand to balance family life with an academic career. The importance of one's career relative to one's partner is positively related to perceived gains in professional mobility due to marriage.

In separate analyses by gender, we find that the presence of children in a household reduces perceived gains in mobility for both non-STEM married men and women. Having an academic partner has a negative association with perceptions of gains in mobility due to marriage for non-STEM female academics, but not with those of men. However, male faculty members who were part of dual-career couple hire have lower perceptions of career success in professional mobility due to marriage compared to women. Male faculty members carrying out administrative responsibility have higher perceived mobility levels due to marriage than their female administrator colleagues.

DISCUSSION AND CONCLUSION

We set out to investigate the extent to which marriage impacts perceptions U.S. academics have of their careers. We asked: (1) how does marriage shape women's and men's perceptions of academic career success? (2) How do perceptions of career gains differ for women and men in STEM to non-STEM fields? And (3) To what extent does parenthood impact these perceptions? Marriage shapes women's and men's perceptions of academic career success and these perceptions are not fully explained by individual and institutional factors. Moreover, the relationship between these individual and institutional factors on perceived gains due to marriage differ across faculty member's gender, discipline, and parental status. We focus our concluding remarks on some of the most interesting results and conclude by spelling out the implications of our findings for policy as well as our study's contributions to the broader gender and academic literature.

Perceptions of Gains in Professional Productivity and Involvement due to Marriage.

Among both STEM and non-STEM academics, women perceive greater career gains due to their marriages than do men, net of all controls. Because we are controlling for career primacy, and being hired through a dual-career policy, this finding does not necessarily reflect the fact that women may be "trailing spouse" that gain employment partly because their husbands negotiate for their jobs. Gender matters above and beyond this. Quite possibly, women, more than men, view being in a marriage as having a system of support for career success. That is, women more so than men might perceive that they gain advice or even a helping hand from their marriage partners and these gains translate into increases in academic productivity and involvement. Future qualitative investigations of how women and men talk about their marriages and careers are necessary to shed further light on this finding.

We also note that for both STEM and non-STEM academics, parenthood reduces any gains they view their marriage has on productivity and professional involvement. We are not surprised by this finding; children require intensive time commitments that potentially reduce time spent doing scholarly activities. We are somewhat surprised, however, that the impact of parenthood is somewhat more negative for STEM men than for STEM women given women's greater ties to childrearing (Sayer, Bianchi & Robinson, 2004; Frehill, 2012). We imagine that any family caregiving done by STEM men is at odds with the STEM discipline norm of total commitment and so could lead to the finding that parenthood is not as positively related to men's perceptions that their marriage results in career productivity and involvement gains.

Having been hired through a dual-hiring policy is not related to STEM academics' perceptions of gains from marriage, but has a positive link to non-STEM faculty members' view of marriage's effects on gains in productivity and involvement. Possibly, non-STEM disciplines are more "open" to dual career hires and having been hired by such a policy poses no limitations or barriers on a faculty member in disciplinary settings more open to dual academic careers. Or, quite simply, non-STEM disciplines tend to have smaller hiring budgets than STEM disciplines and so

dual-career hires are one way academic couples gain employment, thereby making membership in a dual career couple and being hired through a dual career policy a career "plus factor".

Perception of Gains in Professional Mobility due to Marriage

For this outcome, we see greater similarity across STEM and non-STEM disciplines than we do with our first outcome. Regardless of discipline, women perceive less mobility gain from their marriage than do men. This finding is not surprising given the tendency for women to be the "followers" when their male partner get a job. Sometimes, these moves mean women, the trailing spouse, take on lower-status jobs or that the move sets their professional mobility back.

Here too we see a generally consistent negative impact of parenthood on the perception that marriage leads to gains in job mobility. This may result from the general mobility limiting factor of children; once a parent has to deal with finding childcare support and school systems, moving to a new location to take on a job is difficult and in some cases, mobility may be too costly to be feasible. Among those in STEM disciplines, all of the negative parenthood effect stems from men, not women. Here too, qualitative studies would be useful in revealing exactly why STEM men perceive having children makes their marriage decrease gains in mobility.

Having an academic partner lowers the perception that one gains from marriage in terms of career mobility. This finding may simply reflect the challenges facing academic couples in an era when universities may not have multiple academic job offerings at a given time. We believe this finding demonstrates the reality that two bodies are harder to move than one in an academic setting.

Finally, career primacy is associated with the perception that marriage leads to gains in career mobility. Not surprisingly, STEM men gain more from career primacy than do STEM women, possibly because it is the norm of the discipline for men to place their careers over women's. Yet in non-STEM fields, women gain in terms of mobility due to marriage more from career primacy than their male counterparts. We suspect this could be due to the greater opportunity women have in non-STEM fields for opportunities like departmental leadership positions which may elevate the importance of one's career relative to one's spouse.

The results have policy implications for institutions of higher education. By finding that some academics report career loss due to marriage, our analyses have revealed a relatively hidden form of disadvantage. These academics may experience career dissatisfaction that ultimately could reduce their professional productivity and institutional ties. If university policy does not consider faculty member's social lives, they stand to lose. Additionally, the lower perceptions of academic career success for women may lower their academic labor force participation. Thus, our analyses reveal the importance of formal policies and programs to help universities recruit and retain talented dual career academics. The policies help both female and male faculty navigate work and family life, and pursue career and succeed in academic profession.

Our study contributes to the gender and academia literature in two crucial ways. First, findings demonstrate that the connection between gender and perceptions of the way marriage shapes career outcomes is dependent upon the particular outcome under investigation. Women, it appears, feel greater limits to their mobility due to marriage than men do, yet women report greater productivity and involvement gains from marriage than do men. These findings imply, to some degree, that while marriage is geographically limiting for some women it is not necessarily limiting to professional activities.

Second, marriage increases men's and women's perception of career gains and social network opportunities in the profession, particularly if their partners are also employed in academia. Married faculty tend to experience gains from collegial relationship that expand their social network ties. Previous research drawing on women and men across occupations found that married women's social networks focused more on family and married men's on colleagues and so concluded that marriage restricted women's opportunities to form social network ties (Moore, 1990). In academia, the pattern is different. Being already employed in academia opens social network ties for a woman, and if her partner is also an academic, it also expands her network ties to his. Thus, we find evidence that in some professional settings, marriage can yield positive returns to careers.

STUDY LIMITATIONS

The current study has some limitations. First, the use of cross-sectional data does not allow us to examine changes in academics' perceptions over time. It may well be that marriage impacts career gains differently over time. Due to the anonymity of universities in the survey dataset, we were unable to control for specific work-family policies at universities, such as on-campus child care facilities, elderly care and parental leave, and other departmental attributes in our analysis. As a result, the study cannot explain variation in university policies and departmental climates that could affect academics' perceptions of professional gains due to marriage. Lack of information on the age and number of children in an academic's household limit the conclusions we could draw about faculty with the pre-school or school-aged children, whose experiences and perceptions of career undoubtedly differ. Finally, the study draws on data from only thirteen U.S. universities, limiting its generalizability to all U.S. institutions or those outside of the U.S.

RECOMMENDATIONS

Future research should involve following faculty members over time to investigate whether improvement and promotion of work-family programs positively affect academics perceptions, and how the policies help STEM and non-STEM women academics balance work and family roles along with maintaining a research agenda. Such research would help understand best practices of universities in the attraction and retention of academic couples and female academics in both STEM and non-STEM disciplines, and enhancing the productivity of women with young children. In addition, data from more universities, including institutions outside of the U.S., would be useful in identifying the way university contexts and national norms about marriage and work matter for the perceptions of academics analyzed in this study.

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ENDNOTES

1. The terms "academics" and "faculty" are used interchangeably in the U.S. higher education system. We do the same in the paper.
2. Schiebinger et al. (2008) provides a detailed description of the data collection procedures.
3. Factor analysis including rotational strategies displayed high loadings of above 75 percent in the first factor on measures for (3) employment status and (4) level of current position indicating their strong correlations. Furthermore, the second factor was marked by high loadings of above 65 percent on measures for (1) research productivity and (2) time to participate in profession, whereas the third factor contained loadings of less than 45 percent for measures on 5 to 8 showing weak relationships among them. Detailed results from factor analysis are available upon request.
4. In our study, STEM disciplines are defined based on the list provided by National Science Foundation:
<http://www.nsf.gov/pubs/2012/nsf12599/nsf12599.htm#appendix>

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