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Dispelling the Pipeline Myth:

Gender, Family Formation, and Alternative Trajectories in the Academic Life Course

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ABSTRACT

Academic careers have traditionally been conceptualized as pipelines, through which young scholars move continuously from graduate school to tenure-track positions. This understanding often fails to capture the experiences of female Ph.D. recipients, who take ladder-rank assistant professorships at lower rates than do their male counterparts. Where do these women go instead? Data from the 1981-1995 Survey of Doctorate Recipients are analyzed to chart the normative life courses of Ph.D. recipients. Female doctorate recipients are disproportionately likely to take adjunct professorships or exit the labor force, especially if they have young children. Contrary to conventional wisdom, academic positions off the tenure-track provide the best opportunity for getting a tenure-track job down the road. Collectively these findings show that the normative academic life course is both complex and permeable, and therefore not well suited to conceptualization as a rigid pipeline.

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INTRODUCTION

One of the most visible trends in higher education is the employment of temporary adjunct faculty. In 1975, instructors off the tenure-track comprised 43% of American faculty. By 2003, about two-thirds were neither tenured nor tenure-track (Curtis 2005). Accordingly, the majority of recent full-time academic hires have been off the tenure track (AAUP 2005). These positions have been assailed for their poor pay, low job security, and lack of prestige compared to tenure-track appointments (Dubson 2001; Fountain 2005). They are the subject of numerous articles in the *Chronicle of Higher Education*, *Academe*, and other industry publications. For many aspiring scholars, adjunct professorships are the academic graveyard, the place to go when all dreams of a tenure-track position have been extinguished.

This interpretation ignores an important role that may be served by employment off the tenure-track: a springboard to ladder-rank professorships for scholars who did not obtain such positions right out of graduate school (or subsequent to postdoctoral fellowships). Adjunct teaching jobs are a common second choice among recent Ph.D. recipients. Do these positions hinder or facilitate movement to the tenure-track? This paper examines career movement in and out of academia subsequent to Ph.D. receipt, with an emphasis on gender, family, and adjunct positions. In particular, we seek to answer three questions: 1) It has been established that family formation, namely marriage and childbirth, can explain the lower rate at which women obtain tenure-track professorships (Wolfinger, Mason, and Goulden 2004). What kinds of positions do women take instead? 2) Do marriage and children prevent women from obtaining tenure-track employment after pursuing other opportunities out of graduate school? 3) What is the best job from which to obtain a tenure-track position down the road from graduate school?

On a theoretical level, we attempt to chart the normative professional life course for young scholars. The concept of the life course has been used to elucidate eclectic phenomena in the social sciences, including cohort effects (Elder 1999 [1974]), becoming an adult (Hogan 1978, 1981), and the long-term consequences of early life events (Clausen 1991). A central tenet of these and other studies is the ordering of standard life events (George 1993; Elder and O’Rand 1995). Adverse consequences may result when these events do not occur in their customary order (Hogan 1978; Rindfuss, Swicegood, and Rosenfeld 1987). We apply these notions to the academic hiring process to demonstrate the utility of the life course in understanding the intertwined processes of family formation and professional advancement in academia.

Gender, Marriage, Babies, and the Tenure-Track

In the last few years two heavily publicized events have highlighted the difficulties women face in academia. The first, in 1999, was a comprehensive report on gender equity at MIT, which showed that female faculty received systematically inferior treatment (Hopkins 1999). The second took place six years later. In a published address Harvard President Lawrence Summers (2005) suggested that biological differences might be a factor in accounting for the paucity of female faculty members at his institution. His remarks produced widespread backlash and extensive media fanfare (*The New York Times* 2005). Both of these events focused renewed attention on the question of why there are so few female professors. Gender inequality has long been a pervasive feature of the American workplace (see Jacobs 1996 for a review), although recent years have seen noteworthy progress in academia. From 1986 to 2004 the ratio

of women to men in full-time faculty positions rose from less than .4 to over .6 (on a scale where 1 indicates perfect gender parity) (*Academe* 2005).

Traditional explanations for the gender gap in academia focus on discrimination (Carr et al. 2003; Valian 1998; West 1994). Proponents of this argument viewed the MIT report as confirmation of their suspicions, while President Summers's remarks have been construed as evidence that some highly placed academics still harbor retrograde attitudes towards women (*The New York Times* 2005). On the other hand, there are also many reasons to believe that discrimination within the professoriate is not pervasive; indeed, many academic departments and fields have apparently become more welcoming to women in recent years. Roos and Jones (1995), attempting to explain the poor representation of women in sociology departments, suggest that several factors should have led to stronger female representation than had been the case. First, the academic job market grew much weaker after 1970. Simultaneously, levels of extramural funding from federal sources declined. These developments should have made academia less attractive to male job candidates, hitherto comprising the bulk of academicians, and therefore increased women's representation in the pool of aspiring professors. Second, growing awareness about both affirmative action and gender inequities in the academic labor force, such as those manifested by the MIT report, has put increasing pressure on universities to hire more women faculty.

Despite these developments, women's representation in academia has not increased apace with the dramatic growth in female Ph.D. receipt (cf. Sanderson et al. 1999). There is ample evidence of discrimination in the professoriate, but there are also signs of various pressures that should have increased women's representation in tenure-track positions. For this reason it is useful to consider an alternate explanation for the relative absence of women in academia: work-family conflict. This line of reasoning has received noteworthy attention recently. A 2004 issue of the *Annals of the American Academy of Political and Social Science* was devoted entirely to questions of how professional couples juggle work and family, with two articles focusing on academics (Jacobs and Winslow 2004; Mason and Goulden 2004). Ample research now confirms that work-family conflict extends to academic households (Gatta and Roos 2002; O'Laughlin and Bischoff 2004), with female professors spending more time on domestic chores than their male counterparts (Suitor, Mecom, and Feld 2001). It may interfere with a woman's ability to perform the research and teaching necessary for advancement in academia when her domestic responsibilities expand to include childrearing (Bassett 2005). Indeed, some female doctorate recipients avoid academic careers because of perceived barriers to parenthood (van Anders 2004).

Academic careers further conflict with family life by forcing new Ph.D.s to relocate in pursuit of tenure-track positions. Women with husbands and children often lack this flexibility. Relocation presumably poses greater difficulties for women than men, given that female faculty members are much more likely to have husbands with full-time jobs than vice versa. Fifty-six percent of male faculty members have spouses that are employed full-time, compared to 89% of female faculty members (Jacobs 2004). Female academics are also more likely to be married to male academics than vice versa (Astin and Milem 1997; Jacobs 2004), so women may forsake their own academic careers in order to facilitate those of their husbands. It is evidence for these assertions that female academics are more likely than their male counterparts to reside in large cities and other areas with clusters of colleges and universities (Kulis and Sicotte 2002). This suggests that dual career constraints limit women's ability to accept and retain professorships.

Adjunct Professorships: The “Mommy Track”?

Besides the question of gender equity, few issues are more frequently debated in the academy than the proliferation of adjunct professorships. Yet these discussions should not be conducted separately. Instructors, lecturers, and other unranked faculty compose 22% of all female full-time faculty, but only 11% of men (Curtis 2004). Indeed, the proportion of adjunct faculty increased over the same years as did the proportion of women in academia (cf. *Academe* 2005; Curtis 2005). Although an increasing number of women now hold tenure-track professorships (*Academe* 2005), they remain over-represented among adjunct faculty.

There is a class of adjuncts with good outside jobs, who teach only one or two courses at a time (*Academe* 2005). For these individuals, teaching provides intellectual stimulation and extra income. However, they represent a minority. For the majority of adjuncts, teaching is a full-time profession and their primary source of income (AAUP 2005).¹ Their marginal status within academia is well established; one need only invoke the title of Wendell Fountain’s (2005) recent book, *Academic Sharecroppers*, to make this point. Adjunct faculty are paid 26% less than comparable tenure-track assistant professors (Monks 2004). Furthermore, they are less likely to get offices, computers, and other resources that ladder-rank faculty routinely receive. Finally, the proliferation of adjunct professorships compromises the basic mission of American higher education. Because adjunct faculty are not subject to the same scrutiny as tenure-track professors, student learning may suffer (AAUP 2005; Benjamin 2002). Many adjuncts are excellent teachers, but there are rarely mechanisms in place to prevent inferior instructors from joining their ranks. The other component of higher education to suffer is academic freedom: lacking both the security of tenure and a greater stake in the academic system, adjunct instructors have less protection and less incentive to defend the intellectual and moral prerogatives of the professoriate (AAUP 2005).

Adjunct faculty, in short, are second class citizens in almost every respect. They represent an academic version of the “feminization of poverty,” given that adjuncts are disproportionately likely to be female. Since we now know that family formation is one of the reasons why women do not take tenure-track professorships (Wolfinger, Mason, and Goulden 2004), it is logical to determine whether it can also explain why they are more likely to become adjuncts. We speculate that non-ladder rank positions may offer various benefits to female doctorates unable to pursue tenure-track jobs. First, they provide a means of part-time employment, something very rarely found in a tenure-track position. This may be attractive to women with children. Besides lighter teaching loads, these positions do not offer tenure and therefore do not require burdensome work hours for an extended probationary period. Second, adjunct professorships are readily available and therefore may be sought out by married women, whose geographic mobility is frequently constrained by their husbands’ careers. Relying on their husbands’ incomes, married Ph.D.s may be able to make do with the lower salary of an adjunct position. For these reasons, we anticipate that married women and women with young children will be especially likely to take adjunct professorships in lieu of tenure-track jobs.

¹Levels of full time employment by adjuncts are likely to be under-reported. Sometimes faculty members are classified by their institutions as “part-time,” even though they teach four or five courses per term (AAUP 2003). This occurs because adjuncts split their teaching among two or more institutions of higher learning.

Our next question concerns how academics go about reentering the tenure track once they leave it.² In particular, are adjuncts doomed to remain in their second-tier jobs until they leave academia? For people who do not get tenure-track jobs straight out of graduate school, what is the best career choice for those who ultimately desire ladder-rank employment? Perhaps adjunct employment is desirable as the career choice physically and intellectually closest to tenure-track employment. “Staying in the game” might make it easier to secure a tenure-track position down the road. Alternately, the stigma of failing to get a job straight out of graduate school—perhaps often presumed to be the impetus for adjunct employment—may make it more difficult to secure a permanent job later on. Other types of employment, in government or the private sector, may not bear the same stigma. Our analysis will address the question of the best career choices for recent doctorate recipients ultimately aspiring to ladder-rank positions.

Our final question concerns the kinds of people most likely to get tenure-track positions after time spent in adjunct professorships, other professions, or unemployment. Since family formation explains the lower rate at which women get tenure-track jobs out of graduate school, can it also predict which women eventually return to the tenure track? There are at least three possibilities. First, women who do not take ladder-rank jobs right out of graduate school may be permanently selecting themselves into a less demanding career course, one that does not require the long hours and rigid probationary period of a full-time academic career. It is also possible that not obtaining tenure-track employment right after graduate school forecloses the opportunity down the road. Ph.D.s get “stale”; people do not stay current in their fields and do not publish. Another alternative is that women take adjunct professorships right after graduate school in order to raise children, at least until they reach school age. At this point, mothers attempt to secure tenure-track jobs.

Little research has considered the effects of time out of the labor force. No research has considered the implications of academic time-outs, although Noonan and Corcoran (2004) show that female lawyers who take breaks earn less and are less likely to make partner; in later work, Noonan (2005) finds that time out reduces salaries for all women. But the unique career structure of academia presents women with no good opportunity to have children. After four to eight years in graduate school, assistant professors have about six years to publish or perish. Only after tenure and promotion from assistant to associate professor are university faculty assured of job security. The median doctorate recipient is already 34 years old (Hoffer et al. 2001); after a probationary assistant professorship, close to 40. In terms of career development this would be an ideal time for female professors to start their families, but biologically they are already past prime childbearing ages. Mothers 35 and over, for instance, have quadruple the likelihood of having Down’s Syndrome babies (California Birth Defects Monitoring Program 2005). Graduate school may not be an optimal time to have children, both because of the work load and the probable lack of a steady income. The solution may be an adjunct professorship for a few years, until children are school age. Our results will determine whether this is a viable strategy for ultimately obtaining a tenure-track job.

²We refer to movement into ladder-rank positions down the road from Ph.D. receipt as *returns* to the tenure-track, reflecting the notion of a normative pathway between the completion of graduate school and the commencement of a tenure-track assistant professorship; this pathway comprises the *track* that traditionally leads to *tenure*.

Pipeline vs. Life Course

To the best of our knowledge previous studies have not discussed academic careers in terms of the life course. Instead, a common theoretical understanding has been the *pipeline* (e.g., Kulis, Sicotte, and Collins 2002; Long 2001; van Anders 2004). The pipeline, applied especially frequently to the careers of bench scientists but also to academia in general, implies a lock-step sequence of events that can begin as early as high school (cf. Widnall 1988). At this stage, for instance, women may be underrepresented in the courses that might ultimately prepare them for scientific careers. More often, the pipeline to academic success is said to begin in graduate school. An academic job requires a doctorate; scholars cannot normally become full professors without first serving as assistants and associates. Each of these positions represents a stage in the pipeline that academics must pass through in order to rise to the top of the profession, commonly defined as a tenured full professorship.

Xie and Shauman (2003) recently assailed the pipeline model on several counts. Two of their criticisms are particularly relevant for our line of research. The first is the failure of the pipeline model to provide any mechanism for reentry after “leaking” out:

. . . the pipeline model is a developmental framework in which the successful completion of all stages within an ideal time schedule means a positive outcome. Nonparticipation at any stage is equated with dropping out of the pipeline, and movement back into the pipeline after dropout is assumed to be structurally improbable or impossible. Thus, the narrowness of this model has precluded the consideration of alternative educational and career trajectories. . . . (Xie and Shauman 2003: 8-9).

A key objective of our research is to evaluate reentering the faculty pipeline as a feature of alternative trajectories. Xie and Shauman’s (2003: 9) second point concerns the failure of the pipeline model to incorporate the effects of life course events other than educational and vocational outcomes. By failing to take events like family formation into consideration, the pipeline model cannot accommodate their influence on the process by which doctoral students eventually become professors.

With a focus on the normative order of life events (Elder 1994, 2002; Elder and O’Rand 1995; George 1993), the life course is a natural alternative to the pipeline:

In concept, the life course generally refers to the interweave of age-graded trajectories, such as work careers and family pathways, that are subject to changing conditions and future options, and to short-term transitions. . . . (Elder 1994: 5).

This provides a theoretical framework that enables us to understand how moving out of the tenure stream, by taking an adjunct professorship or other means, ultimately affects the likelihood of returning to the tenure-track. Furthermore, we will explore these processes in conjunction with family formation, another variety of life event traditionally conceived as critical in the life course (e.g., Rindfuss, Swicegood, and Rosenfeld 1987). This will facilitate our understanding of how young doctorate recipients go about

achieving tenure-track academic careers. We also hope to contribute new insight about the sequencing of work and fertility in the life course (cf. Budig 2003).

METHODS

Data

For more than 40 years all new Ph.D. recipients in the United States have been administered questionnaires, comprising the Survey of Earned Doctorates. Since 1973, approximately 10% of Survey of Earned Doctorates respondents have been selected for ongoing biennial interviews that continue until age 76 or relocation outside of the United States. Together the repeated interviews of new and former Ph.D. recipients comprise the Survey of Doctorate Recipients (SDR) (National Science Foundation 2003). The result is a large and continually replenished set of panel data on academic careers. We analyze data for respondents queried between 1981 and 1995, inclusive; other years lack necessary independent variables. Our primary sample sizes are 16,049 for analysis of first post-Ph.D. job and 6,501 for analysis of returns to the tenure-track. Overall response rates are good: for instance, about 87% of respondents completed the survey in 1991 (National Science Foundation 1995).

Multivariate analyses employ survey weights that adjust for attrition bias in order to make the data representative. To avoid artificially inflated t-ratios in our significance tests we compute Huber-White standard errors (Winship and Radbill 1994). Missing data are deleted listwise, except when large numbers of missing cases may represent substantively meaningful differences between respondents. For these items, including race, time to complete Ph.D., and quality of degree-granting institution, we code additional dummy variables for missing data. More sophisticated means of handling missing data, such as multiple imputation, do not perform appreciably better (Paul, McCaffrey, Mason, and Fox 2003).

Variables

We analyze two dependent variables. The first is the initial type of employment (or unemployment) reported by respondents subsequent to Ph.D. receipt. Generally this is measured two years after leaving graduate school, although certain conditions, described below, may delay initial postdoctoral employment. Initial employment is a nominal variable with five categories: tenure-track employment (the reference category), adjunct teaching appointment, non-teaching employment within a college or university, employment outside higher education, and unemployment.

This coding scheme ignores post-doctoral fellowships (“postdocs”), because they do not fit well into any category. A postdoc is by definition temporary. Unlike with adjunct teaching positions, it is not possible to string them together perpetually to provide permanent employment. Postdocs may be precursors to any of the five employment states listed above. Our solution is to analyze respondents’ first non-postdoc employment if they report being in postdocs in their first SDR interviews. Since these first interviews take place two years after respondents get their degrees, year-long stints as adjuncts or research associates, common means of subsistence while people are on the academic job market, are not captured by our dependent variable.

The second dependent variable is time to reentry: getting a tenure-track job after spending time in one of the four nontenure-track states described in the previous paragraph. This is coded as a set of event histories.

Our primary independent variables are respondent sex, fertility, and marital status. Marital status is measured with a single dummy ascertaining whether a respondent is currently married; unfortunately it is not possible to know whether unmarried respondents have live-in partners. In addition, the SDR does not indicate whether respondent spouses are also employed as faculty. Fertility is measured with a pair of dummy variables, assessing the presence of children under six and children between six and eighteen. Children under six pose a greater barrier to employment and professional advancement than do older, school-age offspring. In preliminary analyses we experimented with variables measuring numbers of children, but these did not produce substantially different results. Both marital status and children are time-varying covariates in analyses of time to reentry; in analyses of first job, they are measured concurrently with job status. Analyses of time to reentry include an additional independent variable. This is a set of dummies measuring whether respondents are currently: in adjunct professorships, working at a college or university in a non-teaching capacity, or employed outside higher education; out of the labor force is the omitted category.

Control variables fall into two categories, measuring academic and demographic characteristics. Any of these may be correlated with both respondent family formation behaviors and the outcomes we consider. Academic controls include the National Research Council (NRC) ranking of respondents' Ph.D. programs and time to doctoral degree, doctoral field, time since completion of graduate school, and calendar year of Ph.D. receipt. The first two are coded as sets of dummy variables, representing quartiles of the observed continuous variables; field of employment is a trichotomous variable measuring whether respondents received their degrees in the humanities, social sciences, or bench sciences. Year of Ph.D. receipt is measured with a continuous variable. Time since Ph.D. receipt, also continuous and used only in the model predicting initial employment status, accounts for delays produced by postdocs, Fulbrights, and other temporary assignments following the completion of graduate school. This variable is omitted from analysis of reentry because of its correlation with time-to-event.

Demographic controls include respondent race and age. Race is dummy-coded with variables measuring whether a respondent is Black, white, Latino, Asian, or other; age is continuous and time-varying in the analysis. In the analysis of first job type, it is measured at the same time as job status.

Analyses

First employment is a five category nominal variable, so it is analyzed using multinomial logistic regression; tenure-track job is the omitted category. Next, we examine the likelihood of reentry—getting a ladder-rank job after initial employment off the tenure-track—using discrete time event history models, estimated via complementary log-log regression. The complementary log-log is a better estimator than logit or probit when discrete data approximate a continuous time process (Allison 1995: 216-219). Since time-to-event is measured in years, continuous time models would be difficult to estimate.

Data from each wave of the SDR between 1981 and 1995 are used to construct event histories of time to tenure-track employment. For each year in any employment status, an additional record is created. Failure occurs when respondents obtain tenure-track jobs. The

hazard function is captured by a dummy variable for each year prior to a tenure-track job. Based on preliminary analyses we top-code the hazard functions at six. Few respondents obtained tenure-track jobs after six years. We estimate a single model for reentry from the four nontenure-track states (adjunct teaching appointments, non-teaching university employment, employment outside higher education, and unemployment); heterogeneity between the four states is captured with the aforementioned set of dummy variables measuring (un)employment type. Sample size limitations preclude separate event history models for the four.

We estimate two models for each of our two dependent variables. The first model in each pair contains measures of sex, family formation, demographic and academic characteristics. Next we interact respondent sex with the family formation variables (and, for the reentry models, current employment status) in order to show how marriage and children differentially affect men's and women's academic careers. We observed no statistically significant three-way interactions between sex, marital status, and the presence of children, as well as no interactions involving marriage for the analysis of reentry.

RESULTS

Leaving the Tenure-Track

Ph.D. recipients experience five different career outcomes: 1) Tenure-track employment; 2) Adjunct professorships; 3) Non-teaching jobs at institutions of higher learning; 4) Non-academic employment; and 5) Unemployment (postdoctoral fellowships are excluded for reasons described in the methods section). Table 1 shows how respondent gender, presence of children, marital status, and other characteristics affect the likelihood of these outcomes. "Tenure-track employment" is the omitted category on our dependent variable, so we report coefficients that represent the probability of each outcome relative to the chances of getting a tenure-track job. Model 1 shows results that are both logical and unanticipated. As would be expected, women are 45% more likely than men to get adjunct jobs in lieu of tenure-track positions ($\exp[.37] = 1.45$). On the other hand, respondents with young children are 20% ($\exp[-.23] = .80$) less likely to become adjuncts. In most other respects the results are predictable. Respondents who attend middling graduate programs are more likely to become contingent faculty, as are people who took longer to get their Ph.D.s. African-Americans are less likely to become adjuncts compared to members of other population groups.

Table 1 Here

Aside from adjunct professorships, certain other career choices are common among women who do not take tenure-track positions right out of graduate school. According to Model 1, female doctorate recipients are 25% ($\exp[.23] = 1.25$) more likely to take non-teaching university positions than they are tenure-track jobs. Compared to men, women are 9% less likely to work outside academia entirely ($\exp[-.09] = .91$), although the relationship is only marginally significant ($p = .058$). Furthermore, women are far more apt to be unemployed subsequent to doctorate receipt. Compared to men, female Ph.D.s are 159% ($\exp[.95] = 2.59$) more likely to be out of the labor force than they are to have tenure-track jobs.

It has long been known that women are far less likely than men to get tenure-track academic appointments (National Center for Education Statistics 2001). Our results shed light on their other career paths. Compared to men, women who do not take ladder-rank appointments are more likely to stay in academia, either as adjuncts or in non-teaching positions, and less

likely to take non-academic jobs. Also, they are more likely to be unemployed. Married respondents and those with children, young or older, are no more or less likely to take non-teaching academic jobs or employment outside academia. Predictably, though, recent Ph.D.s with young children are 65% more likely than their counterparts without preschool-age children to be unemployed rather than in tenure-track positions ($\exp[.50] = 1.65$).

Many of these results vary substantially by respondent sex. Model 2 adds interactions between sex and measures of family formation: marriage and the presence of children. Two employment choices are especially common among women with families. Women with children under six are disproportionately likely to take adjunct professorships, based on the large and statistically significant interaction term between these two terms. A woman with a young child is 26% more likely to take an adjunct professorship over a tenure-track position in comparison to an otherwise comparable woman without young children ($\exp[.68 - .45] = 1.26$). Compared to a man with a young child, she is 129% more likely to take the adjunct position ($\exp[.68 + .15] = 2.29$). Conversely, a male Ph.D. with a young child is 36% less likely to become an adjunct rather than a tenure-track professor ($\exp[-.45] = .64$). Clearly children have different effects on the career paths of male and female parents subsequent to graduate school. For men, young children push them to seek more lucrative and potentially secure employment, either via tenure-track positions or outside academia altogether. In contrast, young children impel female doctorate recipients to take less demanding, more flexible, but lower-status adjunct professorships.

Predictably, the other common career path for female Ph.D.s with young children is to leave the labor force. Women with children under six are almost four times as likely to move into unemployment rather than a ladder-rank professorship in comparison to women without young children ($\exp[1.63 - .30] = 3.78$). Male parents with young children do not exit the labor force in such numbers. Marriage also leads many women to select unemployment over a tenure-track position, as demonstrated by the statistically significant interaction between gender and marriage. Compared to an unwed women, her married counterpart is 28% more likely to exit the labor force ($\exp[.77 - .52] = 1.28$). Neither marriage nor the presence of young children has any such effect for men; in contrast, both increase the likelihood of taking a tenure-track job over unemployment.

Together, marriage and childbirth largely explain why female doctorate recipients exit the labor force rather than take ladder-rank positions. A single woman without children under six is only 10% less likely to be unemployed right out of graduate school than she is likely to have a tenure-stream job. The same holds true for the likelihood that she takes an adjunct rather than tenure-track position. Recall that women in general are 45% more likely to take adjunct positions. However, a single woman without young children is only 17% more likely to take the second-tier job. It had already been established that family formation is the reason why women do not take tenure-track positions (Wolfinger, Mason, and Goulden 2004). We now know where they go instead: adjunct professorships and unemployment.

Returning to the Tenure-Track

Figure 1 plots smoothed life table estimates for returns to the tenure-track within the first ten years of leaving (in other words, the duration-specific likelihood of getting a ladder-rank job for Ph.D.s whose first postdoctoral positions were not tenure-track jobs). Sample size considerations prevent us from considering later reentries; in any event, almost all returns take

place within a decade. The overall results are not encouraging: only one out of four people who get off the tenure track ever return (By way of contrast, about 35% of recent doctorates get tenure-track jobs as their first non-postdoc employment subsequent to graduate school.) But this figure obscures considerable variation by type of post-doctoral employment. Over half of all Ph.D.s employed as adjuncts right after graduate school manage to get tenure-track jobs within ten years. Reentry rates are also relatively high for people employed at colleges and universities in jobs that do not involve teaching. In contrast, people unemployed after graduate school return to the tenure-track at lower rates; the lowest rates, at about 10%, are reserved for people employed outside academia. The implication of these results is straightforward: the rigid pipeline model no longer fits academia. Many people who exit the academic pipeline will subsequently reenter it. In particular, people remaining involved with higher education are much more likely to get tenure-track jobs down the road. Taking an adjunct teaching position after graduate school does not inevitably signify professional death.

Figure 1 Here

What kinds of Ph.D. recipients return to the tenure-track? Table 2 shows the results of the event history analyses predicting the likelihood of getting a ladder-rank academic position for respondents whose initial post-doctoral employment was off the tenure-track. Looking first at Model 1, we observe that none of the important characteristics motivating this study—gender and family formation—predict reentry. The coefficients for women, children, and marriage are all small and statistically insignificant. On the other hand, various other measured characteristics affect the likelihood of securing a tenure-track job. Respondents with Ph.D.s in the humanities, lacking the career options of people with degrees in the social and bench sciences, are especially likely to land tenure-track positions. The odds of returning are greater for people receiving their doctorates in recent years. Older respondents are less likely to return. Furthermore, the chances of getting back on the tenure-track are highest within five years of leaving it; thereafter, the odds drop 39% ($\exp[-.49] = .61$).

Table 2 Here

Of greater interest are the results measuring current employment status. The estimated coefficients contrast the likelihood of securing a tenure-track (or, very rarely, tenured) position in comparison to doctorates who have left the labor force. Of these respondents, adjunct faculty members have by far the highest rate of reentry: they are four times as likely to get ladder-rank positions as are unemployed Ph.D. recipients ($\exp[1.45] = 4.26$). People working in non-teaching academic positions also get tenure-track jobs at a high rate, with a hazard ratio of 164% ($\exp[.97] = 2.64$). On the other hand, people employed outside academia are 48% less likely to return than are unemployed Ph.D.s ($\exp[-.65] = .52$). These results make intuitive sense. People who stay at colleges and universities, via adjunct professorships and other forms of university employment, are the most likely to get tenure-track positions. There is no way to determine causality: we cannot know whether people who want ladder-rank positions intentionally “stay in the game” by accepting untenured university employment, or if proximity produces contacts, research opportunities, and other sorts of professional capital that can ultimately lead to tenure-stream job offers. Conversely, people leaving academia for outside employment may have little incentive to return.

Model 2 adds interactions between respondent sex and various independent variables to the analysis. Collectively these interactions offer two contributions to our understanding of reentry. First, they reveal noteworthy gender differences in the kinds of post-Ph.D. employment least likely to lead to a tenure-track position down the road. Recall that people employed outside

academia had the lowest rate of reentry, lower even than the rate for unemployed Ph.D.s (Model 1). The statistically significant sex interaction in Model 2 shows that this holds true only for men. Once ensconced in careers outside academia, they tend to remain there. But this does not hold true for women: those employed outside academia have reentry rates only 11% lower than do unemployed female doctorate recipients ($\exp[.88 - 1.00] = .89$). Some women working in jobs outside academia may be doing so only provisionally, until their children reach school age. In contrast, men who leave academia tend to stay out. More likely to be their family's primary wage earners, these men may hesitate to forsake stable careers outside academia for the uncertain future of a tenure-track professorship.

What life cycle factors affect women's return to academia? This is the second question answered by Model 2. In particular, there are statistically significant interactions between respondent gender and the presence of both young and old children. Women with children under six are 22% less likely to get ladder-rank jobs compared to women without young children ($\exp[.19 - .44] = .78$). Furthermore, mothers of young children are 64% less likely to enter the tenure-track than are comparable fathers ($\exp[-.59 - .44] = .36$). These results show that the presence of preschool-age children is an important reason why women who leave the tenure-track stay off it. In addition, the results presented in Models 1 and 2 show that the longer women stay off the tenure-track, the harder it is to return. Both chronological age and time elapsed since leaving graduate school decrease the likelihood of getting a ladder-rank academic position. But school-age children have the opposite effect. Women with children over five have substantially higher rates of reentry. These women are 63% more likely to get tenure-track jobs than are childless women ($\exp[.81 - .32] = 1.63$).

Taken together, these results offer insight into how men and women who leave the tenure-track make decisions about returning. Women avoid ladder-rank positions when they have young children (and, perhaps, when children are incipient). They stay off the tenure-track until their kids reach school age, at which point their rates of reentry increase. Returning is always harder than moving straight through the pipeline to ladder-rank employment after graduate school (or after post-doctoral fellowships, depending on the field). These patterns are reversed for men: they take tenure-track positions at higher rates when they have young children. Presumably their wives or partners will provide childcare. Fathers may also object less to geographical relocation when their children are young and less likely to have their school and social lives disrupted. Conversely, the fathers of older children may be loath to subject their families to the upheaval taking an academic job may entail.

CONCLUSION

The path from graduate school to a tenure-track job is neither homogenous nor seamless. Although many people secure ladder-rank positions right after graduate school, the majority will not. Of these, a noteworthy minority will find their way back to the tenure-track. Thus the usual conception of academic careers as a rigid pipeline is often inappropriate (cf. Xie and Shauman 2003).

This paper offers two general findings about the academic life course. First is the notion of staying in the game. Doctorates who take jobs in academia—non-teaching positions and, especially, adjunct professorships—subsequently get tenure-track jobs at much higher rates than do those who leave it. We cannot know the extent to which this association is causal. For

instance, do people who fail to get ladder-rank professorships the first time around intentionally take adjunct jobs in order to stay involved in college-level teaching? Or are these jobs the natural second choice for otherwise unemployed doctorate recipients? Either way, it stands to reason that academic positions off the tenure-track facilitate reentry. They can provide teaching and/or research experience that fill out curriculum vitae and increase one's attractiveness to academic hiring committees. Many of these jobs are part-time, which may give scholars the opportunity to conduct research (albeit while depriving them of the institutional resources available to tenure-track faculty) and make it possible to travel to job interviews. Finally, they may provide cultural capital in the forms of professional contacts and socialization. For all of these reasons, it is not a professional death sentence for young doctorates to take adjunct teaching positions if they cannot land the coveted tenure-track professorship.

Our second finding concerns the intertwined roles played by gender and family formation in moving off and on the tenure track. Previous research has shown that women are over-represented in the ranks of adjunct instructors (Curtis 2004). Our study confirms that women are significantly more likely than men to become adjuncts right out of graduate school. Furthermore, we identify a key explanation for this trend: family formation. Women with children under six are disproportionately likely to take adjunct professorships. Indeed, women without young children take these positions at rates only slightly higher than do otherwise comparable men. On the other hand, marriage cannot explain why women become adjuncts rather than tenure-stream faculty members. This casts doubt about the prevalence of a common stereotype of young academic couples, in which the husband gets the high status line appointment and his "trailing spouse" teaches part-time. The other common career choice for women with young children is unemployment. Women with children under six are several times as likely as either men or other women to leave the labor force altogether. Marriage does play a role here, with married women especially likely to be unemployed rather than in tenure-track professorships.

Young children not only push women off the tenure track, they keep them off. Women with children under six are disproportionately likely to remain off the tenure-track. In contrast, older children substantially increase the chances of reentry. Together these findings imply a plausible model of the academic life course, although we cannot know for certain with the findings at hand. Women leave the tenure track, customarily for adjunct professorships or unemployment, to raise their children until they reach school age. Thereafter, they seek out full-time employment as ladder-rank faculty members. Women who stay in the game by working as adjunct faculty members, or less frequently, in non-teaching academic jobs, are especially likely to return to the tenure-track. Many will do so, although the longer women stay out the less likely they are to return.

If women with young children leave the tenure-track and women with older children return to it, why aren't women with older children more likely to stay on right after graduate school? Few of these women probably exist. To have older children at the time of doctorate receipt means that childbirth occurred early in graduate school, if not before it. We speculate that these are unlikely times for women to have children (The SDR does not contain information on fertility prior to Ph.D. receipt.) Although we presume that many women at this stage eventually want children—after all, most Americans do (Thornton and Young-DeMarco 2001)—their lives may seem too unsettled to actually start having them.

Women Ph.D.'s interwoven patterns of family and career formation mirror those found in society more generally. Using representative data from the National Longitudinal Survey of

Youth, Budig (2003) found that young children increase women's labor force exits, while older children decrease them. Moreover, women with preschool-age children are less likely to join the labor force in the first place. It makes sense that academic women are adopting this model of family formation, although it works less well in academia than for other professions. Most non-academic women do not have the pressure of keeping their credentials "fresh" via ongoing research. Outside academia, gaps in one's employment history are perhaps more readily understood and accepted. More than most vocations, academia does not really offer any good time to have children. Our results suggest that female Ph.D.s have responded by using adjunct professorships as an imperfect solution to structural problems intrinsic to the academic life course as we have come to know it.

Our findings show that the life course, with its focus on the sequencing of transitions, is a better conceptual tool for understanding women's academic careers than is the pipeline. For women, key professional transitions like moving on and off the tenure-track depend on personal transitions like family formation. Understanding the professional life course therefore requires insight into the family life course. Our insights regarding the interplay between family and career are mirrored by three more general trends in the life course (George 1993). First, disorder in the life course now happens more now than it used to (Hogan 1978, 1981). This is clearly the case in academia: the ranks of adjunct faculty have swollen in recent years, with a stint as a part-time instructor prior to taking a tenure-track jobs traditionally representing a non-normative academic career. Second, disorder in the life course happens more to women than men (Hogan 1985; Kirchoff 1990). This is also the case with our research, given the high rate at which women, especially those with young children, move into adjunct professorships. Third, and finally, disorder in the life course often produces negative events (Hogan 1978; Rindfuss, Swicegood, and Rosenfeld 1987). We do not evaluate common academic outcomes, such as tenure and salary, directly. However, other research indicates that time out of the labor force costs women economically (Noonan 2005; Noonan and Corcoran 2004), and there is no reason to believe academia is any different. Furthermore, time spent in adjunct professorships generally does not shorten the years spent as a pretenure assistant professor.

In the *Structure of Social Action*, Talcott Parsons (1968 [1937]: 91-92) draws a distinction between *normative order* (what should happen) and *factual order* (what does happen). In academia, the two traditionally coincided: young male scholars received their Ph.D.s, perhaps spent a year or two in postdoctoral fellowships, then moved smoothly into tenure-track positions. But increasingly there is discrepancy between the normative order and the factual order of the academic life course. More women are receiving Ph.D.s, yet academia does not offer them any good time to have children. As a result, women have developed a new response to structural problems inherent to the academic life course. In other words, a new factual order is developing in response to work-family conflict in academia. Barring dramatic shifts in the system of academic careers, spending time in adjunct positions may become the new normative order for women desiring both families and professorships. Given the low wages, low status, and lack of job security that characterize these positions, this is not an optimal solution to the difficulties women face in combining families and academic careers.

The proliferation of adjunct teaching positions, echoing the society-wide shift to contingent labor (cf. Barker and Christensen 1998), can provide a means—albeit far from certain—for women to work their way back to the tenure track. But this ad hoc solution illustrates the need for a new normative order for the academic life course to augment the traditional, male-oriented model of academic careers. Possibilities here include more part-time

tenure-track positions and adjunct positions with longer contracts (Wolf-Wendel, Twombly, and Rice 2003), as well as “reentry” post-doctoral fellowships designed to ease new parents back into academia. Our findings also raise more general questions about work-family tensions outside academia. Adjunct positions are a structural feature of the academic workplace that serve specific functions in allowing academic women to stay in the game. Future studies should consider the ad hoc arrangements pursued by women in fast-track professions besides academia.

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Table 1. Multinomial Logit Estimates of First Employment Status subsequent to Ph.D. Receipt (Tenure-Track Professorship is Omitted Category).

	Adjunct professorship		Non-teaching academic		Non-university employment		Out of labor force	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Female	0.37 ***	0.16	0.23 *	0.01	-0.09 +	-0.17 *	0.95 ***	-0.10
Child < 6	-0.23 *	-0.45 **	-0.05	-0.07	-0.05	-0.07	0.50 ***	-0.30
Female*child < 6	--	0.68 ***	--	0.12	--	0.07	--	1.63 ***
Child 6-17	-0.01	0.09	0.10	0.12	-0.04	-0.05	-0.20	-0.22
Female*child 6-17	--	-0.21	--	-0.03	--	0.05	--	0.14
Married	0.01	-0.06	-0.13	-0.26 +	0.03	-0.01	-0.14	-0.52 **
Female*married	--	0.15	--	0.31	--	0.08	--	0.77 **
Field								
Bench sciences	--	--	--	--	--	--	--	--
Social sciences	-0.22 *	-0.22 *	-0.46 ***	-0.45 ***	-0.22 ***	-0.22 ***	-0.67 ***	-0.67 ***
Humanities	-0.14	-0.14	-1.40 ***	-1.41 ***	-1.63 ***	-1.64 ***	-0.74 ***	-0.74 ***
Race								
White	--	--	--	--	--	--	--	--
African-American	-0.84 ***	-0.84 ***	-0.21	-0.20	-0.54 ***	-0.54 ***	-0.77 **	-0.72 **
Asian-American	0.07	0.07	0.02	0.02	0.19 **	0.20 **	0.08	0.10
Latino	-0.29 +	-0.30 +	-0.53 **	-0.53 **	-0.52 ***	-0.53 ***	-0.44 +	-0.46 +
Other/unknown	0.03	0.03	0.08	0.08	-0.34 *	-0.34 *	0.21	0.17
Rank of graduate program								
Best quartile	--	--	--	--	--	--	--	--
2nd quartile	0.25 *	0.26 *	0.03	0.04	0.11 +	0.11 +	0.11	0.15
3rd quartile	0.24 *	0.24 *	-0.28 *	-0.28 *	0.08	0.08	0.06	0.08
Worst quartile	-0.02	0.00	-0.06	-0.05	0.35 ***	0.36 ***	0.19	0.22
Program unranked	0.14	0.15	-0.10	-0.10	0.19 *	0.20 *	0.30 +	0.33 +
Field not ranked	-0.22	-0.21	-0.74 ***	-0.74 ***	-0.34 ***	-0.34 ***	-0.67 ***	-0.64 **
Time to degree								
Fastest quartile	--	--	--	--	--	--	--	--
2nd quartile	0.46 ***	0.46 **	0.33 *	0.33 *	-0.17 *	-0.17 *	-0.01	-0.01
3rd quartile	0.62 ***	0.60 *	0.39 **	0.40 **	-0.08	-0.08	-0.06	-0.10
Slowest quartile	0.57 **	0.53 **	0.07	0.06	0.05	0.05	-0.19	-0.30
Data missing	0.90 **	0.88 **	-0.36	-0.36	-0.24	-0.25	-0.05	-0.11
Age at Ph.D.	0.01	0.01	0.02 +	0.02 +	0.00	0.00	0.05 ***	0.06 ***
Ph.D. calendar year	0.01	0.01	0.01	0.01	0.01	0.01	0.04 **	0.04 *
Time since Ph.D.	-0.01	-0.01	0.00	0.00	-0.17 ***	-0.17 ***	-0.21 ***	-0.22 ***
Constant	-21.33	-19.15	-23.09	-22.16	-18.48	-17.91	-83.01 **	-74.15 *

+p < .10; *p < .05; **p < .01; ***p < .001

Notes: Analyses are weighted. N is 16,049 for both models; log-likelihood is -19,262.09 for Model 1 and -19,174.37 for Model 2.

Table 2. Discrete-time Event History Estimates for Tenure-Track Job Receipt subsequent to Leaving the Tenure-Track.

	<u>Model 1</u>	<u>Model 2</u>
Female	-0.10	-0.59
Child < 6	0.03	0.19
Female*child < 6	--	-0.44 *
Child 6-17	-0.02	-0.32 +
Female*child 6-17	--	0.81 *
Married	0.03	0.04
Employment status		
Adjunct professorship	1.45 ***	1.24 ***
Non-teaching academic	0.97 ***	0.91 **
Non-university employment	-0.65 **	-1.00 **
Not in labor force	--	--
Female*adjunct professorship	--	0.45
Female*non-teaching academic	--	-0.08
Female*non-university employment	--	0.88 *
Field		
Bench sciences	--	--
Social sciences	0.21	0.20
Humanities	0.39 **	0.39 **
Race		
White	--	--
African-American	0.52	0.52 +
Asian-American	-0.23	-0.23
Latino	0.25	0.22
Other/unknown	-0.41	-0.44
Rank of graduate program		
Best quartile	--	--
2nd quartile	-0.07	-0.07
3rd quartile	0.06	0.05
Worst quartile	-0.28	-0.29
Program unranked	-0.33	-0.35 +
Field not ranked	0.31 +	0.27
Time to degree		
Fastest quartile	--	--
2nd quartile	0.05	0.06
3rd quartile	-0.08	-0.04
Slowest quartile	-0.33	-0.32
Data missing	-0.46	-0.51
Age at Ph.D.	-0.03 *	-0.03 *
Ph.D. calendar year	0.05 *	0.06 *
Duration dependence		
Year 1	--	--
Year 2	0.21	0.22 +
Year 3	0.09	0.10
Year 4	0.06	0.08
Year 5	-0.15	-0.12
Year 6+	-0.49 *	-0.48 *
Constant	-110.41 *	-113.69 *
Log-likelihood	-35458.12	-35221.08

+p < .10; *p < .05; **p < .01; ***p < .001

Notes: Analyses are weighted. N is 6,501; 21,435 person years.

Figure 1. Life Tables for Ladder-Rank Employment after Time off the Tenure-Track.

