Fertility postponement and late transitions to motherhood

Abstract: Fertility postponement is a widespread trend. Though fertility intentions data suggest that postponed births will be made up at later ages, age-related declines in fecundity raise doubts about transitions to parenthood at later ages. This paper uses event history analysis and data from the NLSY79 (N = 1,483) to examine transitions to parenthood after age 30. I find that marriage is overwhelmingly the most important predictor of a first birth among women who delay childbearing to age 30, followed by age. The size of the marriage-late fertility association, however, varies by race and education, which suggests that differential selection into childlessness at older ages and differential pathways to late fertility by social groups may be operating.

Keywords:

Fertility postponement is widespread across developed countries. In the U.S., childlessness for women aged 30-34 increased from 16% to 26% over the thirty year period from 1976 to 2006 (U.S. Census Bureau 2008). In spite of the postponement of fertility at younger ages, empirical evidence on fertility preferences indicates that most women in developed countries want children. These preferences have remained stable even as fertility rates have declined and childlessness has increased (Hagewen and Morgan 2005). As childbearing gets pushed to increasingly later ages, women have a narrower window of time in which to complete their desired fertility because of biological limits. Social factors, too, play a role in shaping opportunity structures for achieving fertility goals. As early postponement cohorts have now reached the end of their childbearing years, we now able to examine the weight of these factors.

From a biological perspective, fecundity begins declining as early as the late 20s for women, with more dramatic reductions starting around age 35 (Dunson, Colombo, and Baird 2002). Postponing fertility until the 30s, therefore, carries the risk of involuntary childlessness. Though the trend toward later fertility has coincided with a revolution in reproductive technologies, these new reproductive technologies are unlikely to be a magic bullet for conceiving at older ages as they are estimated to make up for only half of postponed births (Leridon 2004a). Furthermore, the cost of these technologies is sufficiently expensive as to put them beyond the means of many. Thus, temporary childlessness may lead to involuntary childlessness if women underestimate age-related declines in fecundity or overestimate the success of assisted reproduction therapies (Leridon 2004b; Maheshwari, Porter, Shetty, and Bhattacharya 2008).

In addition to the biological bounds of fecundity at later ages, late fertility is also shaped by social factors, both in accounting for selection into childlessness at older ages and understanding the opportunity structure for late transitions to parenthood. Delayed fertility is associated with the revolution in women's education and employment (Brewster and Rindfuss 2000). The growth in women's work opportunities and wages and women's increased attachment to the labor market have increased the opportunity costs of women's time. Economic uncertainty feeds the cycle by creating incentives for human capital investments that further increase women's opportunity costs (Kohler, Billari, and Ortega 2006). Second demographic transition theory additionally emphasizes the cultural shift to individual preferences over the family (Lesthaege 1994).

Though all of these factors are undoubtedly important elements shaping late fertility, partnership may play the most central role in late transitions to parenthood. At a very basic, biological level, a partner is a necessary condition for making the transition to parenthood. But entering into a partnership is a social process governed by attributes and factors both within and outside of an individual's control. Attractiveness, sex ratios, risk tolerance for accepting or rejecting early "offers", and more, factor into partnership success. In addition, social factors may sanction the suitability of a prospective partner or the type of partnership within which fertility may take place.

The growing number of women postponing fertility at younger ages highlights the importance for a better understanding of the processes that support successful transitions to parenthood at older ages. In this paper I investigate where the balance lies between social and biological factors. To this end, I will examine late transitions into motherhood among the NLSY79 cohort of women from a life course perspective. The NLSY79 is a

rich panel dataset with 22 waves of observation and detailed fertility, relationship and employment data, making it ideally suited to evaluating the impact of early life decisions on later life outcomes. In this analysis, I address the following questions: How does completed fertility at the end of childbearing years compare to early life plans for having children conditional on being childless at age 30? What characteristics are associated with higher odds of transitioning out of childlessness after age 30? Do biological or social factors have a higher impact on late transitions to motherhood?

Background and Previous Research

Interest in late transitions to parenthood stems from two key features of modern fertility: the persistent trend of fertility postponement over recent decades and stable fertility intentions (Bongaarts 2002; Frejka and Calot 2001; Hagewen and Morgan 2005; Kohler, Billari, and Ortega 2006). Across countries in the 1990s ultimate desired fertility for women aged 30-34 was for two or more children on average (Bongaarts 2002). If women who delayed child bearing in their 20s are to reach their desired parity by the end of their childbearing years they must begin to make up these births in their 30s. But in light of age-related declines in fecundity, postponement to later and later ages at least suggests the possibility that not all postponed fertility will be recovered at older ages. In other words, fertility delayed may result in fertility forgone. Completed fertility falling short of desired fertility is not uncommon at the aggregate level as Bongaarts (2002) shows for Europe and Quesnel-Vallée and Morgan (2003) show for the U.S. At the individual level as well, completed fertility may fall short of desired fertility, even when

the aggregate correspondence looks quite close, as has been observed for the U.S. (Quesnel-Vallée and Morgan 2003).

Though fertility preferences at the aggregate level suggest positive expectations for late fertility, from a cohort perspective this relationship will necessarily depend on the strength of selection into delayed fertility on the basis of fertility preferences. As a cohort ages, heterogeneity in fertility preferences will increasingly select into motherhood women with strong, positive fertility preferences, while women with either non-positive or weakly positive fertility preferences will become an increasingly larger share of childless portion of the cohort. In the U.S., where childbearing occurs at relatively young ages, we may expect the heterogeneity bias at age 30 to be particularly strong. On the other hand, fertility preferences evolve over the life course, and thus may be an imperfect indicator of heterogeneity bias (Quesnel-Vallée and Morgan 2003).

In addition to level and strength of fertility preferences, selection into childlessness at age 30 may also be tied to a number of other factors. Ellwood and Jencks (2004) find that delayed childbearing is associated with higher educational attainment and is more likely to occur among White women. Life course theory suggests that this differential selection into delayed fertility is the result of individuals responding to different sets of constraints and opportunities, which, in turn, imply different probabilities for transitioning out of childlessness. Accordingly, these associations may provide clues as to the most probable paths out of childlessness. The remainder of this section will look at how educational attainment, employment, and partnership intersect and cumulate to influence transitions from delayed fertility to motherhood at late ages.

Over the past several decades women have increased their level of education and their labor market experience (Goldin 2006; Goldin, Katz, and Kuziemko 2006). Women with college education have shifted increasingly to professional occupations, but research by Goldin (2006; 2004) suggests that at this level having both career and family may be difficult to achieve. Economic theory of fertility suggests that this negative relationship is related to opportunity costs. With higher levels of market skills, women's wages have risen. As childbearing has shifted to later ages, the skill increase has been compounded by longer periods of work prior to union and childbearing in which women have more time to accumulate wage increases. For women who have delayed childbearing, the opportunity costs of having a child include both skill depreciation and higher forgone wage. The true opportunity cost of childbearing is further increased by the motherhood wage penalty and discrimination (Correll, Benard, and Paik 2007; Lundberg and Rose 2000; Waldfogel 1998). Thus, we expect that women with the highest income and in the most skilled occupations will face the highest opportunity costs and be least likely to make-up postponed fertility.

At the same time, raising children requires large monetary expenditure (Lino 2007). These direct costs of fertility compete with the material expectations of young adults, which are shaped by their childhood environment and reinforced by the extended period of work without family commitments (Macunovich 2002). Given the high direct costs of children regardless of parents' income level (Lino 2007) we would expect the budget constraint to be most restrictive for low and middle income women (Gonzalez and Jurado-Guerrero 2006). Thus, with lower levels of own income women should be less likely to recover delayed fertility.

In addition to budget constraints, women may also perceive a time constraint to having children. Increases in women's education and employment have occurred in parallel with increased expectations for remaining in the work force (Goldin 2006). With increased work attachment and experience of work and career demands, women may anticipate conflict in combining work and parenting responsibilities. Thus we would expect women who work the most hours to perceive the greatest time conflict and be least likely to recover delayed fertility. On the other hand, availability of maternity leave and flexible work hours may facilitate entry into motherhood by easing the work-family conflict and reducing opportunity costs.

Though there are clear theoretical reasons for expecting economic relationships to play a role in late transitions to parenthood, Gonzalez and Jurado-Guerrero's (2006) research suggests that the role of a partnership dominates any expected economic effects. In testing the idea of a minimum set of conditions for entering motherhood, they find that entering partnership and completing education are the essential conditions for exiting childlessness across four European countries. Of the economic variables included in their model, women's job security and income are significant predictors of first birth probabilities, but these results go away when the analysis is restricted to partnered women. This suggests that their main role is in facilitating transitions to partnership. Gonalez and Jurado-Guerrero interpret these findings as indicating that fertility is the last step in a set of related and sequential life-transitions.

More importantly, the role of a stable partnership in late transitions to motherhood may reflect the social context within which women make fertility decisions at a very basic level. Biological relatedness is a core schema defining parenthood in Western

societies (Johnson-Hanks and King unpublished manuscript). This schema privileges unassisted biological reproduction, and thus highlights the primary importance of finding a suitable partner. Finding a partner, in turn, may depend on attractiveness in the marriage market, within which health may play a key role, or local marriage market conditions (Goldman 1993). To the extent that these factors play a role in selecting some women into continued childlessness, they may indicate a lower probability for later transitions out of childlessness, regardless of fertility intentions.

On the other hand, delayed fertility at age 30 may be unrelated to marriage market considerations. Rather, delayed fertility for some women may relate to a middle-class culture that values postponing fertility for a period of investment in self-development (Whitley and Kirmayer 2008). Delaying fertility for educational and career investments, in turn, suggests increased attractiveness in the marriage market and thus increased probability for transitioning to parenthood at older ages. Along these line, Martin (2000) finds higher conditional rates of childbearing after age 30 among women with college education.

Finally, the relative importance of marriage, specifically, for fertility outcomes may vary across groups. Ellwood and Jenks (2004) find that mothers with the most education are the least likely to be never married, and the vast majority of highly educated mothers with infants live with their husbands. White mothers, too, are less likely to be separated, divorced, never-married, or widowed compared to Black mothers (Ellwood and Jencks 2004 Figures 1.7-1.11). These trends may indicate socio-economic class differences in cultural emphasis on marital childbearing, or they may point to

differential returns to marriage by socio-economic class. In either case we would expect the marriage-conditional late fertility relationship to vary by education level and by race.

Methods

Data

This analysis relies on a subset of women from the National Longitudinal Survey of Youth 1979 who experienced delayed fertility. Fertility delay for this analysis is defined as being childless at age 30 both because age 30 is beyond the mean age at first birth in the U.S. and because age 30 represents a significant social and psychological age transition. The analysis is restricted to women on the basis of the tighter biological link between fertility and age. Women enter the analytic sample in the survey wave in which they turn 30 (1987-1994) and are followed through the most recent survey wave in 2006, which results in observation times ranging from a maximum of 14 survey waves to a minimum of 1 survey wave. This range in observation time results from a combination of age differences, a change in survey administration from annual to biennial, and survey attrition. The original sample in 1979 interviewed 6,283 women. By age 30, only 1,483 women remained childless, representing approximately one quarter of the women originally interviewed. Of the 1,483 women in the childless-at-30 sample, 604 women are censored in 2006 with no observed event by the last point of observation, and 344 women are censored in various years between 1988 and 2004 because of survey attrition.

Measurement

Outcome

The primary outcome of interest in this analysis is having a first birth. In each survey wave, respondents are asked about children born since the last interview. The transition to parenthood is operationalized as a dichotomous variable indicating whether or not respondents had a first birth in a particular survey wave. Cases exit the risk set after experiencing a first birth. Censoring occurs at the end of the observation period in 2006 or at the last known interview date.

Independent variables

Desired fertility is represented by two variables: fertility preferences at age 30 and current fertility preferences. Desired fertility at age 30 is taken from the question asking respondents how many additional children they expect to have. Given that all respondents in this sample are childless at the age of 30, the additional children expected question can be interpreted as total desired fertility at age 30. Current fertility preference is constructed from the same variable, but this variable is allowed to change at each survey wave and thus reflects how respondents may revise their fertility preferences over the life course. Both variables are implemented as dichotomous variables in order to focus on the important distinction between wanting children and not wanting children.

This analysis also controls for baseline fertility preferences. This measure of desired fertility is taken in 1979, the first year of the survey, when respondents are aged 14-22. Because of the youthful age of respondents, this baseline measure can be thought of as approximating a pure measure of fertility preferences. This interpretation is further supported by the wording of the question, which asks respondents how many children they *want* to have, as opposed to how many children they *intend* to have, which is asked separately.

Current marital status is recorded with 5 categories – never married, married, separated, divorced and widowed. For this analysis separated, divorced and widowed are collapsed into a single category – "previously married". Recognizing that this variable fails to distinguish cohabitation, models are also tested using a relationship code variable. Each year respondents' current relationship partner is classified as one of the following: never reported spouse or partner, no current spouse or partner, spouse, partner or other. Both marital status and relationship status are time-varying variables, and thus reflect the impact of respondents' current status on birth transitions.

Respondents' education was taken from the variable recording highest grade completed as of May 1 of the survey year, which ranges from no formal education to 8 years of post-secondary education (0-20 years of education). For this analysis, years of education completed was further classified into a dichotomous variable for any college education (13 years of education or more) or no college education (up to grade 12).

Several variables representing employment characteristics are also used. Employment status is represented by a binary variable for working vs. not working. Cumulative employment experience, a running count of all the years a respondent reports being employed, is also included; it makes no distinction between full- and part-time employment. The hours per week variable represents time intensity or time commitment to work. It is measured by asking respondents how many hours they worked in the survey week at all jobs.

Income is reported as total pre-tax income in the past calendar year including wages, salary and tips. Though non-response bias is often a concern with income data, the NLSY79 shows high response rates on income questions, with more than 95% of

respondents reporting own income and spouse's income (U.S. Bureau of Labor Statistics 2006 Table 4.22.4). All models use log of respondent's income.

Maternity leave is a yes/no indicator variable reported continuously in the NLSY79 from 1985 as part of the employer-provided fringe benefits questionnaire (U.S. Bureau of Labor Statistics 2006). Respondents are asked whether maternity leave is available at their current or last job. However, to be eligible for the questionnaire, respondents had to report working 20 hours or more per week; the self-employed and military personnel on active duty were also excluded. These criteria exclude anywhere from one-quarter to one-half of respondents in any given survey year (U.S. Bureau of Labor Statistics 2006,Table 4.16.1). To accommodate excluded respondents, the maternity leave variable is extended in this analysis to allow a third category for "not reported". This category includes all respondents who were ineligible for the question, but excludes missing respondents and missing data on eligible respondents.

Analysis

I use discrete-time event history methodology to analyze the transition to motherhood among women childless at age 30. Event history analysis allows us to ascertain who has a birth after age 30 and which characteristics are most strongly associated with having a birth after age 30. In addition, these techniques are well suited to handling data with censoring and time-varying covariates. Discrete-time analysis, in particular, is called for because of the discrete measurement of event times, which results in a substantial number of ties in the data.

The data are organized into observational records for each respondent in each survey wave, from wave 9 (1987) to wave 22 (2006), with each record representing one person year of analysis. Respondents enter the risk set in the survey year in which they turn 30. The dependent variable is a dichotomous variable indicating whether or not a first birth occurs in that survey wave. Predictor variables are time-varying, with the exception of race/ethnicity and fertility preferences. To avoid potential endogeneity with the birth of the first child and predictor variables (particularly in the case of variables measured after the first birth), predictor variables are lagged by one survey wave[1] to approximate the time of conception. Observational records are then pooled to estimate a logistic regression model by maximum likelihood according to the following equation:

$$\log\left(\frac{P_{it}}{1-P_{it}}\right) = \alpha + \beta X_{it-1}$$

where P represents the probability of having a first birth for individual *i* at time *t* and X_{it-1} represents a vector of explanatory variables for individual *i* at time *t-1*.

Results

This analysis seeks to understand the transition to motherhood among women childless at age 30. Table 1 displays summary statistics of respondents at the time they enter the analytic sample (Panel A) as well as marital transitions between age 30 and the most recent survey wave (Panel B). Panel A gives a picture of how women childless at

[1] Due to a change in survey administration in 1994 from annual to biennial, this lag varies in the data from 1 year to 2 years prior to the birth of the first child. Though this inconsistency is undesirable, it is unavoidable and preferable to endogeneity problems that may arise from predictor variables measured near or after the birth.

30 differ from their counterparts with children. On average women without children have higher income, more work experience and more education. These women are more likely to have college education and graduate degrees. They are also less likely to have entered marriage; nearly half of childless women are never married compared to only 16% of women with children. Though relationships are changing over the time span of interest as respondents move into and out of marriage, one-quarter of the women childless at 30 will remain never married at the end of the survey, as shown in Panel B. Though Table 1 illustrates clear differences between women childless at 30 and the members of their cohort who have already transitioned to motherhood, there is no way for us to distinguish between selection and causality. Doubtless both are at work.

The first question posed by this analysis is how completed fertility compares to early life plans for having children. Fertility preferences may be linked to selection into childlessness and thus account for fertility outcomes to some extent. Table 2 shows the distribution of fertility outcomes by measures of desired fertility (Panels A and B) and by marital status (Panel C). (Survivorship curves are also presented in appendix B.) Panels A and B point to two important features of the data. First, Panel A indicates that the majority of women selected into childlessness at age 30 have positive fertility preferences, both at baseline and at age 30. Even though downward revision occurs over time, at age 30 three-quarters of these women still express positive fertility intentions. Second, positive desired fertility appears to have some association with transitions to parenthood. Among women with consistently positive desired fertility, more than half go on to have a birth by the end of their childbearing years, compared to less than a quarter of women who maintain zero desired fertility (Panel B). Wanting children, however,

does not appear to be sufficient for determining fertility outcomes. By the end of their childbearing years, only half of the women with positive desired fertility had experienced a birth. Looked at another way, Panel A suggests that roughly two-thirds of women childless at the end of their childbearing years experience involuntary childlessness. This jumps to 86% when using the 1979 measure of desired fertility. Panel C suggests that transitions to marriage are key to understanding transitions to parenthood. Never-married women are the least likely to transition out of childlessness, with even women who never wanted children transitioning to parenthood at a higher rate (18% vs. 22% respectively).

To better understand these transitions, we turn to the logistic regression to identify factors that facilitate and constrain the transition to motherhood at older ages. Table 3 presents the results from various models. In general, these models show three predictor variables to be strongly associated with late transitions to motherhood: fertility preferences, marital status, and age. Employment characteristics such as cumulative employment experience, income and work hours have little or no effect. The effect of race/ethnicity and college education varies by marital status.

In models 1 and 2, fertility preferences show a strong and positive association with odds of a first birth. Model 1 uses only baseline fertility preferences as a predictor variable, while controlling for age. Expressing positive fertility preferences at the first survey wave is associated with 56% higher odds of transitioning to parenthood. Accounting for revisions in fertility preferences over the life course, however, appears to be more important than youthful intentions, as model 2 shows. Not only does baseline fertility lose significance in model 2 when fertility preference at age 30 and current fertility preference at each interview are added, but the latter two predictor variables also

show larger association with late fertility outcomes. Non-zero fertility preference at age 30 is associated with 67% higher odds of a first birth, and maintaining positive fertility preferences at each survey is associated with odds that are more than 4-times higher. Furthermore, these odds ratios remain large and significant even as additional variables are added to the model.

Though the results in models 1 and 2 clearly point to the importance of current preferences, they cannot speak to the endogeneity issue. It is equally plausible that women's fertility preferences reflect the fertility goals they ideally would like to achieve as that respondents revise fertility preferences to reflect the most likely outcome in light of individual circumstances. The large association with current fertility preferences found here may point towards the latter interpretation.

Relationship status has an even stronger association with late fertility. In models 3 and 4, currently married women have close to 6-times higher odds of a first birth compared to women who have never reported a spouse or partner, and currently cohabitating women have two and a half times higher odds. Even women with no current spouse or partner appear to have an advantage over women who have never reported a spouse or partner, with 60% higher odds of having a first birth. Being married at age 30, on the other hand, has no association with fertility outcomes.

Like relationship status, age is also a highly significant predictor of late fertility, with a similar sized association to that observed for marriage. The age-late fertility association is also non-linear, which is not surprising given what we know about age related declines in fecundity. The age-squared parameter indicates that the higher odds ratio associated with the age parameter declines as women get older.

Employment characteristics are generally found to have no statistically significant association with late fertility outcomes. Being in the labor force is associated with a slight reduction in odds of a first birth, whereas own income and cumulative employment experience have a slightly positive association with late fertility. But, again, these coefficients are not statistically significant. Additional economic variables such as home ownership and family net worth were also tested and found to be insignificant, with odds ratios close to 1. (Results available from the author upon request.) Increasing weekly work hours also appears to have no association with post-30 fertility outcomes. This result is robust to different specifications of work hours that look at amount of overtime.

Availability of maternity leave is one employment characteristic that does show a significant association with post-30 first birth transitions. How to interpret this result is less clear. Among women who are administered the fringe benefit questionnaire, there is no statistically significant difference in the odds of a first birth between women in jobs that offer maternity leave and jobs that do not offer maternity leave. The interesting result is that women who were not asked the fringe benefits series, that is, women not working or women not working enough hours to meet the threshold, have significantly lower odds of a first birth compared to women working full time in jobs with maternity leave. Given the exclusion criteria, we may have expected the results for this group to be similar to the results for current employment status, which shows slightly lower odds for women in the labor force. Yet what we observe here is the opposite, which makes this result somewhat puzzling. This may reflect heterogenous selection into late childlessness, for example deferred fertility related to career development versus deferred

fertility related to health problems or disability, which may overlap with labor force status.

The results for education and race vary across models, and in particular, depend upon interactions. The results in models 3 and 4 suggest that women with college education have slightly higher odds of a first birth by 7%-11%, but this coefficient fails to reach significance at the $p < .10$ level. Race, on the other hand, initially shows a significant and negative association with late fertility that attenuates with controls. Model 2 shows 36% lower odds of a first birth after age 30 for Black women compared to White women. This difference appears to be largely explained by differences in marital status and education between Black and White women. These results change again in model 5, which tests for two interactions suggested by the empirical evidence on late childbearing – education and marriage and race and marriage. As predicted, the association between college education and first birth varies by marital status, as does the association between race and late first births. College educated women are more likely to have a first birth if they are married compared to being not married. White women are also more likely to have a first birth in the context of marriage.

The results of this analysis are presented graphically in figures 1 and 2, which plot the predicted probability of a first birth by age. In the event history analysis framework these graphs should be interpreted as the probability of experiencing a first birth within a one-year age interval conditional on not yet experiencing the event and remaining in the risk set. Figure 1 shows the differences in predicted probabilities by relationship status based on model 4. This graph illustrates the clear "advantage" of marriage for late first birth transitions throughout the post-30 years. The line for married women does not

converge with other relationship status groups until the end of childbearing years. Figure 2 shows the differences in predicted probabilities for women with specific characteristics. It is based on the interactions incorporated in model 5. Again, this graph demonstrates the association between marriage and late first birth transitions. The additional advantage of being White or being college educated, conditional on being married, are of similar magnitude. Women who are both White and college educated have the highest predicted probabilities of a late first birth of all women.

Discussion

This analysis finds that delaying fertility to age 30 is associated with only a moderate chance of achieving fertility by the end of childbearing years, in spite of the prevalence of positive fertility preferences. Being currently married is overwhelmingly the most important predictor of having a first birth. Cohabitation is found to also increase the odds of having a first birth, though at a much lower level.

What is interesting to note about the results for marriage in this analysis is that they are similar to the results for age. Given the popular perception of women's fecundity as a ticking biological time clock, one might expect to see age as the most important predictor of late fertility outcomes. Yet this analysis finds that marriage is as important as age, if not more important for certain social groups. This result may also appear counter-intuitive in light of the growth in non-marital births in the past twenty to thirty years in the U.S. These results may reflect differences in cultural norms surrounding childbearing outside of marriage that at the same time influence selection into late fertility. As this is a cohort analysis, it is also possible that these findings reflect

values and norms of an older generation, and it is not clear if this result will pertain to women of a younger generation.

Economic and employment characteristics, on the other hand, appear to be unimportant for late transitions to motherhood, or at least not as important as the opportunity costs line of thinking would predict. These results are contrary to Gonzalez and Jurado-Guerrero's (2006) findings for Italy, Spain, France and West Germany. In the full sample, they find that job insecurity reduces first birth probabilities. Though restricting the analysis to partnered women reduces the importance of economic indicators for first birth probabilities, they continue to find significant associations for own income and home ownership, which are not found here. This may point to the different economic and institutional context of the U.S., where both the labor market and housing market are more flexible than in Europe.

These results are also consistent with Martin (2000). He finds that college-educated women have higher post-30 fertility rates, conditional on being childless at age 30, compared to women with less education, but his analysis did not control for marriage. Controlling for marriage in this analysis, I find that the association between college education and late fertility is contingent on making the transition to marriage. The race-late fertility association also depends on marriage. Together, these interactions are consistent with a class-values interpretation of fertility outcomes.

Over and above the basic biological necessity of a partner, the significant results for partnership status found in this analysis may point to other key features of marriage, which may all be operating on this sample. A great body of research has established that healthy people are more likely to be selected into marriage (Brockmann and Klein 2004;

Goldman 1993). The same health traits that influence selection in the marriage market may also be linked to health of the reproductive system, thereby depressing the likelihood of fertility in the non-married group. The importance of marriage for fertility outcomes may also be heightened here by the analytical focus on women childless at 30 if it is the case that class differences in selection into delayed fertility are associated with class differences in emphasis on childbearing within marriage. Finally, the marriage-fertility relationship may also reflect the symbolic significance of fertility to cementing a relationship (Vikat, Thomson, and Hoem 1999).

Though I find strong results for the importance of marriage as a pathway to late fertility, this analysis stops short at the question of the direction of causality between marriage and childbearing. Tough it may seem that children are the product of marriage, it may well be that for some women marriage is the only acceptable pathway to achieving fertility goals, thus motivating women to enter marriage.

Finally, these results pertain to the cohort of women born between 1957-1964. These women were raised in the 1960s and 1970s and experienced late childbearing in the 1990s, which likely creates unique cohort and period effects for these women. Younger cohorts will have their own unique set of cohort and period effects. Because of the increase in fertility postponement, younger cohorts will see greater proportions of women reaching age 30 without having had children. At the same time, women's education has been increasing and societal norms have become more accepting of non-marital childbearing and permanent childlessness. The future may also bring more affordable or more effective fertility therapies. We may well expect to see late fertility increasing and a greater diversity of pathways to late fertility.

Table 1. Sample Summary Statistics

Panel A. Summary statistics at age 30 in comparison with women with children

	Without children	With children
Education (years)	14.1	12.4
Percent with some college	64.8	33.7
Percent with 4+ years college	36.3	11.6
Income	$18,781	$9,075
Employment experience (years)	9.1	6.6
Percent with intended parity 0 in 1979	11.1	5.8
Percent with intended parity 0 at age 30	24.8	N/A
Percent never married	48.3	16.3
N	1,483	3,543
Childlessness by racial/ethnic group		
Hispanic	23.5%	76.5%
Black	24.0%	76.0%
Non-Hispanic non-Black	34.1%	65.9%
Total	29.5%	70.5%

Panel B. Marital transitions between age 30 and most recent survey wave for women childless at age 30

	Marital status in 2006[a]			
	Never married	Currently married	Previously married	Total
Marital status at age 30	%	%	%	%
Never married	24.5	19.4	4.6	48
Currently married	0.0	31.1	8.5	40
Previously married	0.0	5.5	6.4	12
Total	24	56	20	100.0

[a]Only 1,120 respondents interviewed in 2006 of the original 1,483 women childless at age 30

Table 2. Completed Fertility by Select Characteristics

Panel A. By two measures of desired fertility (column percent)

	Fertility preferences			
	Baseline (1979, ages 14-22)		Age 30 (1987-1994)	
Completed fertility	0	1+	0	1+
0	67.7%	51.6%	78.8%	45.6%
1+	32.3%	48.4%	21.2%	54.4%
Total (N)	133	1095	292	936

Panel B. By change in fertility preferences (column percent)

	Strength of fertility preferences			
Completed fertility	Always zero	Revised downwards to zero by age 30	Revised upwards from zero by age 30	Always positive
0	78.6%	79.2%	59.7%	44.4%
1+	21.4%	20.8%	40.3%	55.6%
Total (N)	56	231	77	856

Panel C. By marital status at last survey wave[a] (column percent)

Completed fertility	Never married	Currently married	Previously married
0	82.4%	38.0%	59.1%
1+	17.6%	62.0%	40.9%
Total (N)	279	635	225

Note: Children ever born taken from last recorded interview between 2002 and 2006. 78% of non-missing responses were recorded in 2006 when respondents were aged 42-49. Though respondents age 42-44 plausibly have remaining childbearing years, rates of childbearing between ages 42-45 are virtually zero, making fertility projections for the remaining childbearing years unnecessary. CEB is not reported for respondents who dropped out of the survey earlier than 2002.

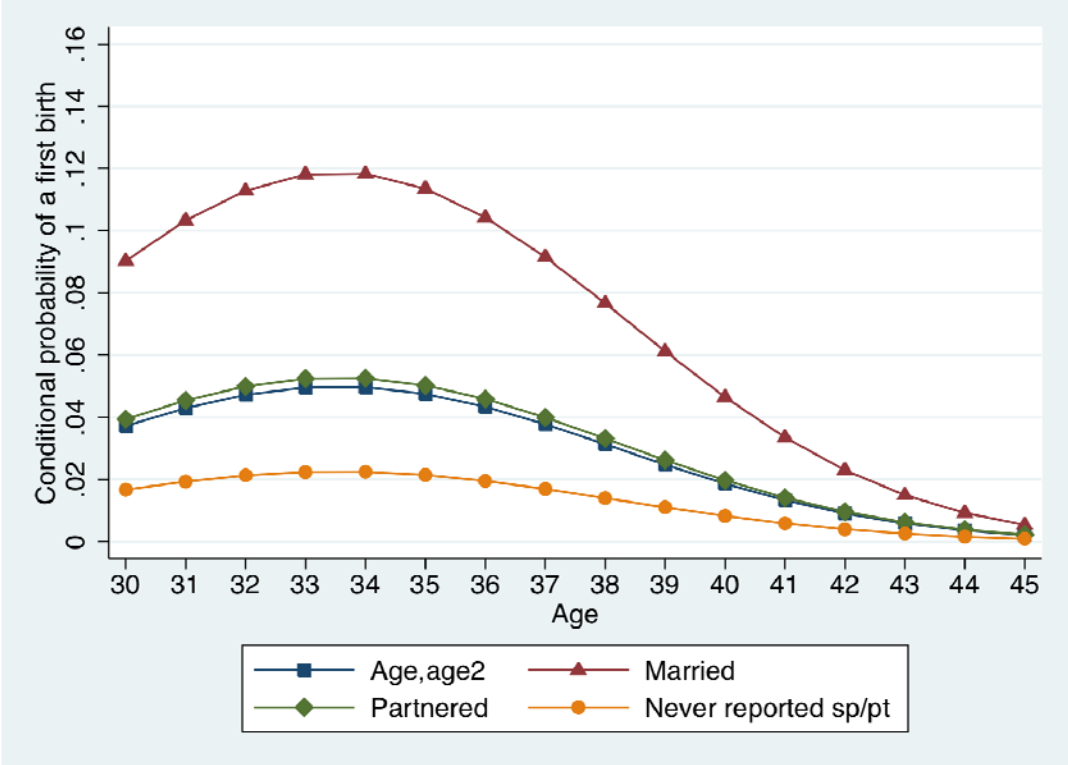
[a]Only 1,120 respondents interviewed in 2006 of the original 1,483 women childless at age 30

Table 3. Odds of a First Birth After Age 30

	Model 1	Model 2	Model 3	Model 4	Model 5
Baseline fertility preference	1.56***	1.08	1.15	1.14	1.14
	[0.26]	[0.18]	[0.20]	[0.20]	[0.20]
Age	5.97***	5.60***	5.44***	5.13***	5.17***
	[1.65]	[1.54]	[1.52]	[1.45]	[1.46]
Age^2	0.97***	0.98***	0.98***	0.98***	0.98***
	[0.00]	[0.00]	[0.00]	[0.00]	[0.00]
Fertility preference at age 30		1.67***	1.64***	1.60**	1.61***
		[0.30]	[0.30]	[0.29]	[0.29]
Current fertility preference		4.53***	4.13***	4.14***	4.10***
(time-varying)		[0.76]	[0.71]	[0.71]	[0.70]
Hispanic		0.9	0.99	1.01	
		[0.12]	[0.13]	[0.13]	
Non-hispanic black		0.64***	0.92	0.93	
		[0.08]	[0.12]	[0.12]	
Relationship status					
Never reported spouse/part (ref)			---	---	---
No current spouse/partner			1.60**	1.60**	1.55**
			[0.33]	[0.33]	[0.32]
Spouse			5.82***	5.86***	2.74***
			[0.90]	[0.91]	[0.69]
Partner			2.43***	2.44***	2.58***
			[0.53]	[0.54]	[0.58]
Marital status at age 30			0.96	0.96	0.97
			[0.08]	[0.08]	[0.08]
College education (any)			1.11	1.07	0.75
			[0.12]	[0.12]	[0.13]
Employed (0/1)				0.97	0.98
				[0.20]	[0.21]
Employment experience (years)				1.01	1.02
				[0.02]	[0.02]
Own income (logged)				1.08	1.08
				[0.07]	[0.07]
Weekly work hours				1	1
				[0.00]	[0.00]
Maternity leave					
Yes (ref)				---	---
No				0.99	0.98
				[0.14]	[0.14]
Not asked				0.73*	0.73*
				[0.13]	[0.13]
Interactions					
White					0.69**
					[0.12]
White*Spouse					1.86***
					[0.39]
College*Spouse					1.72**
Observations	8602	8602	8558	8557	8557
LL	-1947.85	-1838.94	-1705.05	-1701.21	-1693.92

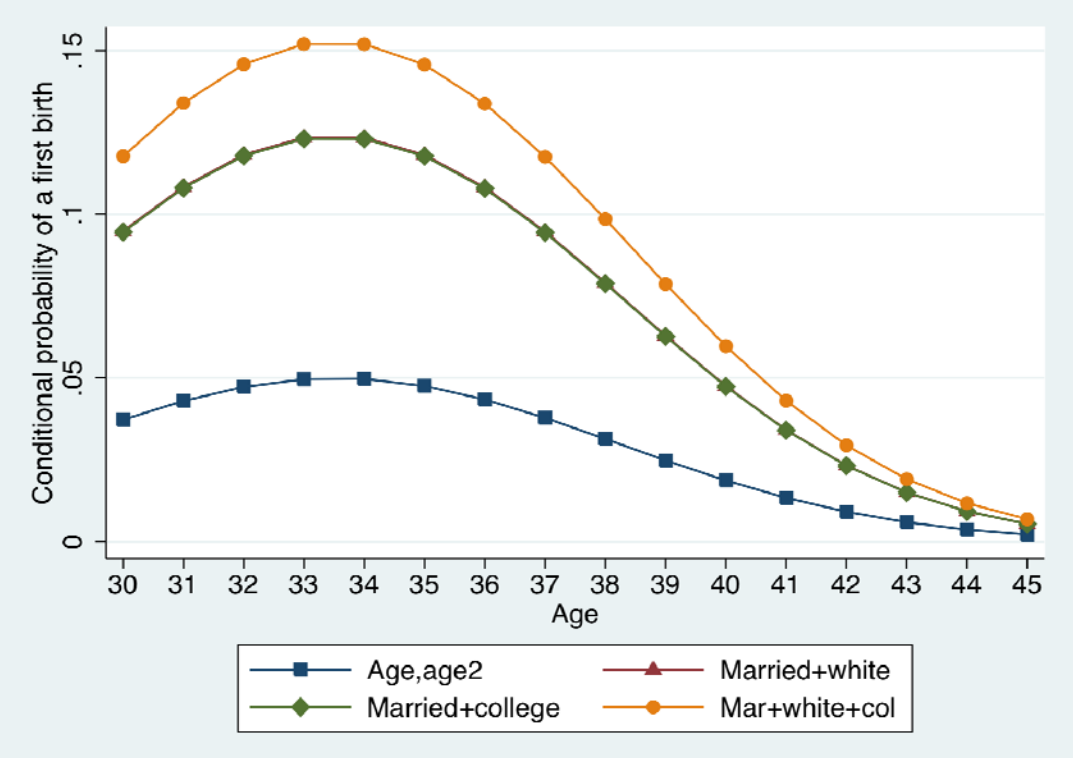
Note: Standard errors in brackets
*p < .10. **p < .05. ***p < .01.

Figure 1. One-Year Predicted Probabilities for Having a First Birth, by Relationship Status



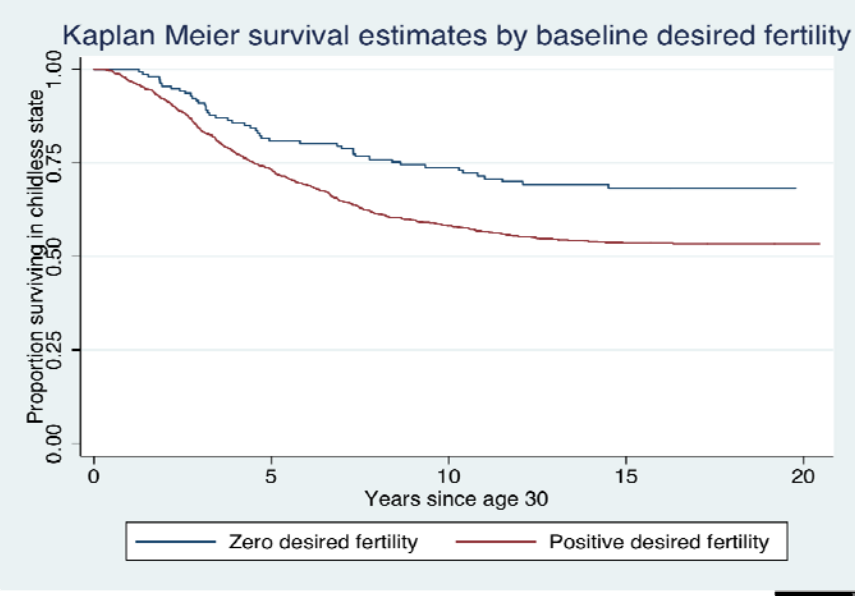
Note: Based on model 4

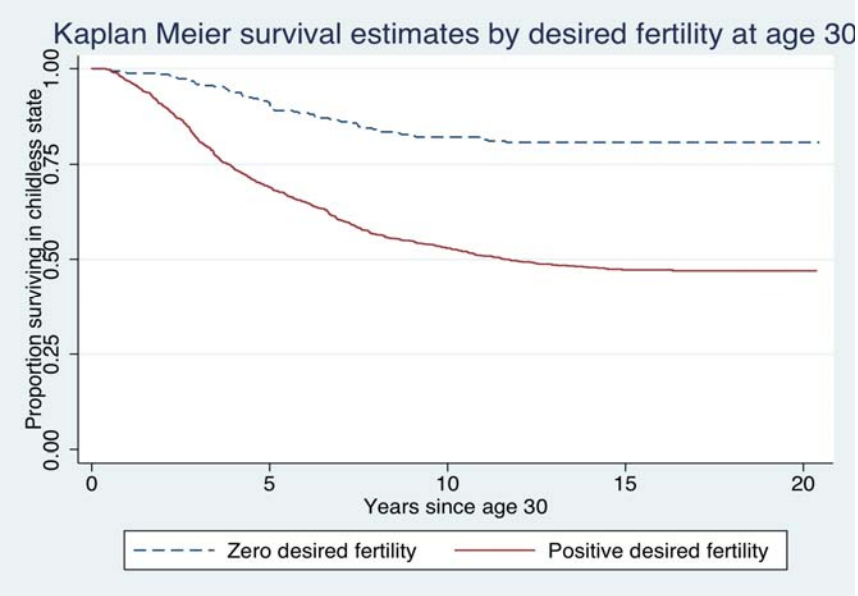
Figure 2. One-Year Predicted Probabilities for Having a First Birth, by Selected Characteristics



Note: Based on model 5

Appendix A. Survival in the childless state by desired fertility measured at two points in time





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