Late, but not too Late? Postponement of First Birth among Highly Educated U.S. Women

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Abstract

We examine the link between postponement of parenthood and fertility outcomes among highly educated women in the U.S. born 1920-1986, using data from the CPS June Supplement 1979-2016. We argue that the postponement-low fertility nexus noted in demographic and biomedical research is especially relevant for women who obtain education beyond college because of the potential overlap of education completion, early career stages and family formation. The results show that they differ from college graduates in timing of first birth, childlessness, and completed fertility. While postponement is sustained among U.S. highly educated women beginning with cohorts born in the late forties, its associations with childlessness and completed parity have changed considerably over cohorts. We delineate five distinct postponement phases over the eighty-year observation window, consistent with variation in the prevalence of strategies for combining tertiary education and employment with family formation over time.

Keywords: fertility, education, postponement, parity race, inequality, childlessness, parenthood, first birth, postgraduate education

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ABSTRACT

We examine the link between postponement of parenthood and fertility outcomes among highly educated women in the U.S. born 1920-1986, using data from the CPS June Supplement 1979-2016. We argue that the postponement-low fertility nexus noted in demographic and biomedical research is especially relevant for women who obtain education beyond college because of the potential overlap of education completion, early career stages and family formation. The results show that they differ from college graduates in timing of first birth, childlessness, and completed fertility. While postponement is sustained among U.S. highly educated women beginning with cohorts born in the late forties, its associations with childlessness and completed parity have changed considerably over cohorts. We delineate five distinct postponement phases over the eighty-year observation window, consistent with variation in the prevalence of strategies for combining tertiary education and employment with family formation over time.

INTRODUCTION and BACKGROUND

Increasing educational attainment is one of the key factors characterizing social change and development over the course of the 20th and early 21st century, including changes in family formation. Notably, a postponement of the entry into parenthood to later stages of the life course took place, and childlessness at older ages has become much more common (Gustafsson 2001, Cherlin 2010). In the 23 OECD countries for which data are available, mean age at first birth increased by 0.08 years per calendar year since 1970 and is now at 28 (Barclay and Myrskalä 2016). Kohler, Billari, and Ortega (2002) note that postponement is initially a response of individuals to socio-economic pressures and incentives, including rising returns to human capital and subsequent investment in education; youth unemployment; uncertainties or shortages in the housing markets that hinder establishment of independent households by young people, and so on. Social feedback (Kohler, Billari, and Ortega, 2002: 657) reinforces the effects of these conditions through the erosion of norms about the right time to have a first child, increased uncertainty about the optimal timing of childbirth, and social feedback processes in labor and marriage markets; the authors call this the "postponement transition:" a permanent change of fertility regimes in the population.

The link between postponement of first childbearing and completed fertility or childlessness is discussed both in the biomedical literature and in demography. A recent review of the topic comes to the blunt conclusion that "Female fertility has a 'best-before date' of 35, and for men, it is probably before age 45–50." (Balasch and Gratacos 2011: 271). Although recent empirical evidence (e.g. Barclay and Myrskalä 2016; Goisis, Remes, Barclay et al. 2017; Myrskalä and Fenelon 2012) and methodological problems may cast doubt on the certainty of this statement, it is well-documented that female fertility declines after age 35-40 and later births may not only be more difficult to achieve but also associated with health problems for children and mothers. However, recently fecundability has been shown to decline only very modestly between the late 20s and the mid-30s of a woman's lifespan (McDonald et al. 2011), and likely even beyond the age of 35 (Eijkemans et al. 2014), theoretically allowing for a further delay of first motherhood and widening of the educational differential. In addition, as Kohler, Billari, and Ortega (2002) point out, later births allow parents to accumulate human capital and other resources that benefit children in many ways. Myrskalä and Fenelon (2012) show that these negative effects of advanced maternal age on child outcomes likely reflect selection and other factors unrelated to maternal health at the time of pregnancy and birth. In sum, there is considerable uncertainty about the population effects of postponement of first birth on completed fertility, and on effects for parental and child health and development.

Our study extends the literature on the postponement-quantum nexus, focusing on its implications for family formation processes among highly educated women in the U.S. Specifically, we argue that the postponement-low fertility nexus is especially important for women who obtain education beyond college because the potential overlap of education completion and family formation during peak fertility times in the life course is more relevant for this group. The aim of our study is to examine differences in first birth timing, childlessness, and changing linkages over time in the postponement-completed fertility nexus between women with college education and those who obtained more schooling. Drawing on data from the Current Population Survey June Supplement 1976-2016, we present data on median ages at first birth, childlessness at age 43, and achieved parity for women born between 1920 and 1985. We show significant differences between the two groups on every indicator for most cohorts, with some convergence among more recent birth cohorts. We identity five distinct postponement regimes characterized by differences in the postponement-quantum nexus, which are consistent with different strategies of women to combine and sequence educational attainment, careers, and family formation. Our findings also suggest diverging pathways into motherhood between black and white women, even among this most highly educated segment of the population.

Postponement-Quantum Effects

Morgan and Rindfuss (1999) analyze the association between age at first birth and completed fertility for a sample of U.S. women born between 1910 and 1950. These data show a robust association between age at first birth and parity at age 40-44, which is however weakening among more recent cohorts. The underlying causal mechanism, according to the authors, is likely selection into early motherhood and higher parities, and, conversely, into late motherhood and low parities, rather than a causal effect of postponement on parity. For example, women with a strong preference for having many children would start early to realize these preferences. Kohler, Skythe, and Christensen (2002) attempt to estimate the causal effect of fertility with a Danish sample of MZ twins born between 1945 and 1960, and propose a model that accounts for preferences. According to their findings, postponement does indeed affect fertility, and that effect increases with increasing postponement. However, just like Morgan and Rindfuss (1999) they find the effect declines in more recent birth cohorts. Billari and Borgoni (2005) propose another method to account for selection into postponement, and show that the estimated effect of postponement of first birth on transition to second birth is not affected by selection.

Kohler, Billari, and Ortega note that while postponement in general is not related to total fertility, postponement to very late ages (as seen in the lowest-low fertility countries of Southern Europe with median ages of first birth at 27-29 in 1999) may reduce fertility "because it leaves little time for catching up." (2002: 646) They show for selected European countries that higher median ages at first birth are associated with lower fertility, but that the strength of the association varies between countries and has weakened in some countries over time. The analyses also show that that the effect of postponement on childlessness is at best modest; hence, postponement affects higher parities more than first births. The paper also presents some evidence on rectangularization, or reduction in the variance of age at first birth. If few women have their first child before their late twenties and biological or social factors put a limit on births in the late thirties or forties, fertility will be concentrated in the early thirties, resulting in narrower age bands for the time in the life course in which first birth occurs. This is a sign that increases in mean ages at first birth may have reached their limit (2002: 669), with women being aware of potential age limits and therefore increasingly attempting to achieve the first birth before late becomes 'too late'.

Goldstein (2006) presents an interesting thought experiments in this context, asking how late first births could be postponed without fundamentally altering parities and childlessness observed in a Danish cohort of women born in 1963. He comes to the conclusion that a median age as late as 33 at first birth would still satisfy two basic restrictions on the distribution: that not more than one third of first births occur after age 35, and that the standard deviation is not smaller than 4 years (the lowest variance observed at the time in Europe). Goldstein presents findings from a sample of U.S. women with advanced degrees for comparison, which comes close to this limit (with a median age at first birth of 31.3) without implying especially low parities (2006: 161). While the postponement literature generally focuses on Europe because fertility in the U.S. was at replacement until very recently, and U.S. women, on average, do not delay first birth as much as their European counterparts, Goldstein's example shows an interesting exception. Similarly, others show that in the U.S. postponement occurred primarily among college educated women (Goldstein and Kenney 2001, Martin 2000). Shang and Weinberg (2012: 24-25, table 4) in particular present data showing that even among college graduates, additional years of schooling increase childlessness and reduce parity.

Tertiary Education and Family Formation

Previous research documents significant postponement of entry into parenthood among college graduates compared to women with lower educational attainment in the U.S. (Heck et al. 1997, Yang and Morgan 2003, Martin 2000, Rindfuss et al 1988). College graduates' median ages at first birth may have shifted to well beyond age 30 in recent and current birth cohorts, as many women today are experiencing first births in their mid-to late 30s and even early 40s (Beaujouan and Sobotka 2017). Shang and Weinberg (2012) report particularly low fertility and higher childlessness among college graduates giving birth in the in the mid-nineties with increases thereafter. It is unclear, however, whether these recent increases indicate a weakening in the link between postponement and quantum or whether postponement has declined as well.

Goldin (2004) discusses five distinct strategies of college graduates in combining family and career: The oldest cohort (graduating 1900-19) chose between either a career or a family, the second cohort (graduating 1920-45) had a job first and then a family, the third cohort (graduating 1946-mid 1960s) had the family first and then the job, the fourth cohort (graduating in the late 1960-late 1970s) opted for a career first and then family, while the fifth cohort (graduating in the 1980s and 1990s) attempted to have career and family simultaneously (Goldin 2004). Clearly, these strategies imply very different pathways with potential impacts on postponement, cohort-specific variation in timing, and quantum of fertility.

Beginning in the mid-sixties, women were increasingly likely to obtain graduate degrees beyond college (e.g. Goldin 2004). Table 0 shows that the proportion of women enrolled in school in the 25-34 age group increased from 16% to 26% between 1980 and 2010, with a slight decline in 2015. A good third of black women in this age group are enrolled in school in 2010. Even in the 30-34 age group one in ten white women and one in six black women were enrolled in school in 2010. Hence, the timing of education completion increasingly overlaps with peak times for family formation.

--Table 0 about here--

Although education completion is one of the life course transitions that is likely to occur before family formation (Ni Bhrolchain and Beaujouan 2012), along with leaving home and entering the labor market, it is possible that women adapted to the timing squeeze by having children while still in school, or by going back to school after having had children.[1] The alternative is further postponement. Given already long postponement among college graduates, it is an open question whether effects on parity and childlessness might result for those obtaining further schooling. We shed light on these questions by providing cohort-specific data for both college graduates and women with graduate schooling, focusing on age at first birth, childlessness, and parity. Hence, we are not attempting to identify the causal effect of postponement on fertility, if any; rather, we describe the strength of its association and changes therein over a time period covering the 1940s to today.

The questions we address are as follows: How does the median age at first birth develop over time among highly educated women? Are there differences between college

[1] Kuperberg (2009) indeed finds a slight increase in the proportion of graduate students living with small children in 2010 compared to earlier census years.

graduates and those obtaining further schooling? Are increases in median age at first birth associated with increased childlessness and lower parity? Are documented recent increases in fertility among highly educated women (see Shang and Weinberg 2012; Vere 2007) associated with earlier median ages at first birth, or do recent cohorts "catch up" by having more children later in the life course?

In addition to mean age at first birth, we examine variation in the distribution. While the discussion in Kohler, Billari, and Ortega (2002) implies reduction of variation (see the discussion of rectangularization above), there are also reasons to assume increased variation. Goldin's (2004) five strategies mentioned above imply cohort differences in variation of timing of fertility. In addition, educational expansion has meant that highly educated women have become more diverse over time on a variety of dimensions that may correlate with preferences regarding fertility and timing, including race/ethnicity and social background. To isolate potential compositional effects on the population statistics we present, we also provide additional analyses, separating white and black women. In keeping with earlier research, we find that black women initiate childbearing somewhat earlier in the life course, and in most cohorts are less likely than white women to do so in their late thirties.

DATA AND METHODS

Data

The data come from selected years of the of the June Supplement on Fertility of the Current Population Survey (CPS). The June fertility supplement is available annually or bi-annually since 1971. The target population has changed over the years. From 1971-1977, only married women were included. We therefore limit the analysis to the data collected in and after 1979 to avoid selection bias. With the purpose of keeping the sample population as comparable as possible from year to year, we selected 19 out of the 28 available survey years.[2] The sampling frame of the CPS changed over the years as follows: 1979: all women 18-59 (and 14-18 if ever married), 1980: all women 18+ (and younger if ever married), 1981-83: all women 18-59 (and 15-18 if ever married), 1985: all women 18+ (and younger if ever married), 1990: all women 15-65, 1992: all women 15-44, 1998-2010: all women 15-44, 2012-2016: all women 15-50. Due to these changes in the sampling frame, we limit our analyses to age 18-44. Because of the rather steep decline in number of first births after age 40, however, it should be possible to describe the first birth process well. The pooled data contain 43,307 women with postgraduate education and 96,884 women with college degrees (without further postgraduate education). The large number of cases allows for a representative investigation of the fertility processes of postgraduate educated women, who were a very small group relative to their birth cohorts for much of the last century.

As a cross sectional dataset, the CPS does not follow individuals over time, although retrospective fertility measures have been collected. As a further disadvantage, no information about educational trajectories is available, so that women are classified according to their educational status at the time of survey. It is possible that some women had a different educational status at the time of their first birth or that they have acquired more education after the time of the interview. The first scenario is not problematic, because we are interested in the eventual age at first birth and likelihood to remain childless of all women who end up with graduate education at any time in their life course, which includes those who have children first and go to graduate school thereafter. The second scenario, however, might lead to bias in case certain groups, e.g. black and white women, have a different likelihood of going back to school after the birth of the first child (and after the interview). This would downward bias the fertility of the group who is more likely to acquire graduate schooling after

[2] Other survey years from the 1980s were excluded due to the lack of information on women's ages at any birth.
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the birth of a child. Our strategy to pool cohort data over multiple waves of surveys into synthetic cohorts counteracts this potential bias to some extent because we capture cohort members at different points in the life course. In addition, we carefully compare cohort-specific estimates from survivor functions with cross-sectional estimates derived from women aged 40 and older at the time of the survey, which would only very rarely be affected by additional educational attainment. We did not detect downward bias of completed fertility and age at first birth and are therefore confident that we are able to describe fertility timing and parity well.

Measurement of Key Indicators

Motherhood and Age at First Birth – Missing data and imputation. The June supplement has consistently collected information on the number of live births a woman has ever had and on the timing of her last birth, although the latter item was discontinued in 2012. There are no missing values on these two and other key variables (e.g. education, race) across all waves of the June CPS. In addition, some surveys (1980, 1985, 1990) have collected full fertility histories. Surveys taken before 1998 and after 2010 also contain information on the timing of the woman's first birth, but, unfortunately, the CPS omitted this question between 1998 and 2010. For survey years 1998-2010 (roughly 20% of our pooled sample) we therefore reconstructed ages at first birth, using a refined application of the 'own child method'. Reconstructing the fertility history from household data ('own child method') is common practice in demographic research and deemed reliable (Kreyenfeld 2002). It has drawbacks, though, e.g. overestimation of ages at first birth and of childlessness for women whose children were not present in the parental home at the time the survey was taken. To avoid such bias, we applied our own refined version of the 'own child method', taking advantage of the additional information (number of children ever born, age at last birth, full birth histories of other women) available, in a three-step procedure. In a first step, we derived the age at first birth for those women who reported only one live birth directly from the ‘age at last birth’ variable, accounting for roughly 30% of mothers in survey years 1998-2010. Second, for mothers of two or more children, we compared the number of births a woman reported to have ever had to the number of children living in her household. Only if the two numbers matched, we subtracted the age of the oldest child in the household from the age of the mother to calculate her age at first birth. This left us with ca. 30% of mothers in this subsample from surveys 1998-2010 without a match (thus less than 10% of the full sample). In a third step, we developed an imputation method for these cases, using the partial information provided. This method is based on birth-spacing, and estimates the woman’s approximated age at first birth by subtracting spacing intervals from the women’s age at last birth for her specific number of children. In other words, we estimated average parity-, 5-year birth cohort-, and race-specific (black, white, Hispanic) spacing intervals using data from the women with complete fertility histories (provided by the CPS survey years 1980, 85, and 90). We used the spacing-information from the 1960-65 cohort for the younger cohorts. We found that spacing indeed differs by birth cohort, parity and race, while there were only minor differences between educational groups within birth cohorts, parities and race (results not shown). We then used this birth-spacing information to substitute imputed age at first birth for women with missing first birth timing information, by subtracting the median parity specific monthly interval of birth spacing for each additional child from the date of last birth.

Education. Until 1990, the CPS collected education as years of schooling, from 0-18+.[3] In 1992 and later, the educational variable switched to a measurement of highest degree

[3] Before 1992, respondents were asked some version of these two questions: What is the highest grade (or year) of school this person has ever attended? Did s/he finish the highest grade (or year) s/he attended?

completed, with 16 categories in total. We collapsed those two variables into one educational variable with five categories: less than high school, high school, some college, college and postgraduate education. Our group of those with postgraduate education consists of individuals who had 17 or 18+ years of education (before 1992) or reported to have completed a Masters or Professional degree or a PhD (after 1992). In the June Fertility Supplement data, information on current school enrollment is incomplete and therefore we cannot distinguish between those enrolled in graduate school at the time of survey and those with completed graduate schooling.

Race. The measurement of race has changed in the CPS over the years. Surveyed individuals self-identified with an increasing number of racial categories over time. Black, white and 'other' were the basic categories, Native American and Asian were added in 1989. In 2003, measurement of race was expanded into 21 categories switching from a single-race to a multi-race classification. We coded everyone who self-identified as white only as white, and everyone who self-identified as black only as black[4]. In addition, for the survey years 2003 and later, we classified individuals as black who self-identified as a mixed-race category containing black and one other racial group. Categories containing three or more races were coded as 'other'. This decision was based on the argument made in the literature that mixed-race individuals with African American heritage are more likely to self-identify as black (Davis 1991; Qian and Lichter 2007). However, we did not make this assumption for mixed-race individuals with three or more races, because possible self-identification as black is less clear in these cases.

The changes in the coding of race in the CPS are a potential concern in case individuals who identified as black in the scheme before 2003 did systematically self-identify

[4] There is no race category for Hispanics in the CPS. Individuals with Hispanic origin can, however, self-identify in a separate indicator. We did not exclude individuals who identified as Hispanics, hence, Hispanics are included in our data among Whites and Blacks, depending on which race they self-identified.

differently after 2003 (or self-identified as non-black before and were reclassified by our strategy as black). This would mean that the population identified as black is different for the survey years before and after 2003. Qian and Lichter (2007) have shown with IPUMS data that the racial classification of mixed race individuals will likely make no significant difference for the group of the African Americans. This is due to historically low intermarriage rates between blacks and whites (and blacks and other minorities) and small numbers of mixed race offspring with African American heritage relative to the black population as a whole (Qian and Lichter 2007:78). Indeed, there are very few of these cases in our sample, we are therefore confident that our race indicator is consistent across survey years.

Methods

We perform survival analysis using Kaplan Meier estimators to estimate cohort-specific first birth survival functions to derive ages at which 25%, 50%, and 65% of all births have occurred. We present survival rates at age 44 to measure childlessness; the 50th percentile of survival time yields cohort-specific median ages at first birth, while the 25th percentile is useful to understand at which age the 'fastest' quarter of a birth cohort has transitioned to motherhood. Because estimated childlessness is above 30% for some cohorts, we chose the 65th percentile to provide a rough indicator of the social and/or biological limits of fertility. The difference between the ages at which cohorts reached the 25th and 65th percentiles is our measure of the variation at in age at first birth. We present results for postgraduate educated women and college educated women (without further postgraduate education) separately, and compare estimates between these two groups. We present results for women of all race and ethnicity (white, black, other, Hispanic), and for the groups of white (non-Hispanic) and black (non-Hispanic) women separately.

We have grouped women into birth cohorts spanning five birth years each, yielding 15 birth cohorts. The cohort born 1976-80 is the last one for which we can provide a childlessness measure (at age 40 instead of age 44). This estimate may be subject to future change because part of this birth cohort had not reached age 40 at the time of the most recent surveys. We show partial Kaplan-Meier results for cohorts 1981-85 and 1986+. Furthermore, we present completed parity measures by birth cohort and education, showing the proportions of women aged 40- 44 with zero children, one child, two children, and three or more children for each birth cohort. We focus on this specific age group, because the number of women aged 45 and older in the sample fluctuates across cohorts due to the sampling changes in the CPS. While some fertility still occurs in the early 40s, chances to conceive with own oocytes appear to be rather rapidly declining after age 40 (CDC 2015, Habbema et al. 2015). Since some fertility is likely to still occur in the early 40s of these women, the parity measure should be largely robust, and if biased at all, then slightly downward biased. The proportions of childlessness estimated by descriptively examining women aged 40-44 only yields very similar results to the findings of the survivor functions, offering a robustness check for our main estimates. All survival time estimates including confidence intervals and graphs of survival functions of postgraduate and college educated women can be found in the appendix.

RESULTS

First birth postponement

Tables 1a-1c depict ages at 25% survival time for first birth, median ages at first birth (50%), and 65% survival time for the cohorts born between 1921 and 1980, for all women (table 1a, including all races and ethnicities), and separately for white non-Hispanic and black non-Hispanic women (tables 1b-1c). Figures for the corresponding survival functions for all women are available in the appendix, as are extended versions of the tables, showing age estimates and the 95% confidence intervals.

--Table 1a about here--

As expected, table 1a shows that significant postponement of first births occurred starting with the cohort born between 1941-45, then sharply increased in the cohort born between 1946 and 1950, for both women with postgraduate education and with college degrees. Median ages at first birth rose from 26/27 to age 30 for postgraduate women, and from 24/25 to 27 for the college educated in the 1946-50 cohort. Postponement further increased and reached a peak among the cohort born in the late 1950s (1956-60), to a median at of 33 for postgraduate women and 30 for those with college degrees. For the cohorts born after 1960, first birth timing has remained stable; median ages plateaued at ages 32 for postgraduate women and at 30 for the college educated. In the birth cohort 1981-85, a slight further increase among college educated women to 31 paired with an increase in the age at the 65th percentile to 35 is visible, indicating convergence of the timing of first birth with that of postgraduate women in this cohort.

Postponement is also expressed in the increases in age at which our cohorts reach the 25% percentile, from 22/23 to 28/29 for postgraduate women and 22/23 to 26/27 for college graduates. In contrast to the other measures, however, we do not see decreases after the peak postponement cohorts. Rather, we see a stabilization in this measures for both groups, with some divergence between them beginning with women born in the fifties.

Our estimates of the age at which 65% of women have had their first child are significantly higher among postgraduate women than among the college educated. The peak postponement cohort (1951-60) reached the 65% percentile at age 38/39 for postgraduate women, and 34 for college educated women, representing large increases over earlier cohorts who reached the 65% percentile in their early thirties or late twenties respectively. Women born after 1960 reached this point gradually earlier. Accordingly, Table 1a shows that variation in the timing of first birth is much larger among postgraduate women than among college women in the pioneering 'postponement-cohorts' (1941-1960) with a differences between 25% and 65% percentiles of 11 years for the former vs. 6-8 years for the latter. In particular, the age-span between the median age and the 65th percentile is wider among postgraduate women in these cohorts, indicating that many of them kept postponing well beyond the age at which half of their peers had reached motherhood. These latest ages at first birth of the 65th percentile coincide with high childlessness among postgraduate women in these cohorts, as discussed below. Notably, the 25th percentile to 65th percentile survival time age ranges converged for college and postgraduate women born after 1960 at 7 years.

Black White First Birth Timing Differentials

Table 1b presents the same measures as above for white women only, and table 1c for black women.[5] Taken together these tables suggest that among both white and black women, those with postgraduate training delay childbirth more than college graduates. However, black women consistently reach the 25% percentile earlier in the life course than white women, resulting in greater variation in timing of first birth, with the exception of the cohorts born 1940-1960. Rather than declining, variation in timing increases among black women born thereafter, consistent with different strategies by this group to combine educational attainment and family formation.

--table 1b and 1c about here---

[5] Note that table 1a includes women we classified as "other" race/ethnicity, as well as women of Hispanic origin of either race. Table 1b only includes white, non-Hispanic women.

In sum, table 1a shows considerable differences between college graduates and those with postgraduate training, both in terms of postponement and in terms of variation in the transition to motherhood; these differences were largest among women born 1940-1960 and have since declined, as postgraduates born after 1960 are increasingly concentrating first births in their mid-to-late thirties. Differences between white and black women (tables 1b and 1c) emerge in particular regarding the early part of the process; black women who have children early have them much younger than white women, which is well known; yet, we show this pattern also holds among the two most highly educated groups of the population.

Childlessness

Tables 2a-2c show estimates of childlessness at ages 44. Three main findings emerge. First, childlessness differs significantly between postgraduate and college educated women, even for the oldest cohorts (born in the1920s and 1930s), who still had young median ages at first birth (22-24) among postgraduate women compared to later cohorts. Thus, relatively young median ages at first birth in the early 20s of the life course link to childlessness of 22 percent or higher. The postponement to median ages in the late 20s and early 30s of the 'pioneering-postponers' (1941-60) was then paired with record levels of childlessness of the cohorts born between 1946 and 1960, namely of 30-33 percent, meaning that a third of postgraduate educated women in the 1956-60 cohort remained without children. Childlessness also increased to its highest level among college graduates for the 1951-60 cohorts (25-27 percent). Here, relatively young median ages of childbirth of 26 pair with relatively high childlessness, indicating that childlessness among many highly educated women likely was a voluntary choice or involuntary necessity due to work-family incompatibility at that time, and not necessarily due to ongoing postponement to very late ages at which conception was jeopardized for women who wanted children. Interestingly and in line with this argument, sustained postponement of the cohorts born in the 1960s, 70s, and 80s is still associated with decreasing childlessness to the lowest levels among postgraduate women (1970s cohorts). The birth cohort 1971-75 is the first to see an only small and insignificant differential in childlessness between postgraduate and college educated women.

These trends are roughly similar, although at times more extreme, for black women. The comparison between table 2b and 2c (panel 1) shows that postgraduate black women are at least as likely as their white counterparts to remain childless in most cohorts; furthermore, the decline in childlessness among those born after 1960 is less pronounced, both among college graduates and postgraduates. Even though many black women in both groups make the transition to motherhood relatively early, compared to their white counterparts, those who postpone are just as likely to remain childless in most cohorts.

Parity

Postponement of motherhood may lead to lower completed fertility not necessarily via childlessness, but also through lower progression rates to second or higher parity births. Figures 1a and 1b show the number of children women had at ages 40-44 for the examined birth cohort. In contrast to the analyses on timing, for the analysis of parity we rely on data drawn from women aged 40-44 at the time of the survey to avoid bias caused by differences in average age between cohorts due to the changes in the CPS sampling frame for the June supplement. We therefore limit the figure to birth cohorts 1936-40 to 1971-75. The 'pioneering-postponement' cohorts of women born 1946-60 have a high prevalence of childlessness and also a large decrease in the proportion of mothers with three or more children compared to postgraduate women in the previous cohorts. While the proportion of mothers with one child has increased only very slightly, it has remained basically the same for mothers with two children among the pioneering postponers. Thus, transitions to higher parity births appear to have been most affected by the 'very-late' postponement. Note that the same trend is present among college educated women (1951-60 birth cohorts). A reversal back to higher average parities takes place with birth cohorts 1960+ among postgraduate women and birth cohorts 1965+ among the college educated.

--Figures 1a and 1b about here--

Finally, we report average completed parity in figure 2. Here we present two versions, one limiting the sample to women aged 40-44 at the time they took the survey, and the other including all women aged 40 and older, which includes the older cohorts. Figure 2 clearly shows significant differences between college graduates and postgraduates in the expected direction; both groups show substantial declines in average parity until it stabilizes at the lowest level for birth cohorts 1946-1960. More recent birth cohorts show a slight increase for college graduates and a more pronounced increase among postgraduates, resulting in a convergence of the two groups. We next turn to the question of how these changes in parity relate to timing of first birth.

Associations between first birth timing and completed parity

Table 3 provides more information on the association of fertility timing and completed parity and how it changes over cohorts (average number of children, for mothers only). Four main findings come to the fore, applying to postgraduate and college educated women alike. First, declines in average parity took place in the cohorts of the pioneering postponers (1940-60) among all mothers, regardless of timing of first birth. Yet, notably, the decline in average parity was much more pronounced among mothers who had their first child early in the life course, in particular before age 25, compared with their counterparts having children at later ages. For instance, average parity of postgraduate women who had their first child between the ages of 20 and 24 declined by one child from ca. 3.2 among birth cohorts 1920-35 to ca. 2.2 among birth cohorts 1946-59. Declines in parity among postgraduate women with first birth ages of 30-34 were in the range of half a child or less, from 2.5/2.2.children among birth cohorts 1920-35 to ca. 1.9 children among birth cohorts 1946-59. Second, average parity started to decline already in the birth cohort 1936-40, before first birth postponement and steep increases in childlessness among highly educated women took place. Parity declines in this pre-postponement cohort likewise took place among all women, regardless of first birth timing. Third, the reversal to higher average parities among birth cohorts 1960+ shown in figures 1a and 1b obtains across the board, regardless of timing of first birth. Taken together, table 3 shows that the association of first birth timing with average completed parity remains present throughout cohorts, but its strength varies considerable across birth cohorts. Among highly educated women, the association of early first birth timing with highest completed parity was strongest for the birth cohorts of the 1920s and 1930s, then declined, reaching its weakest point for the birth cohorts of the 1950s. For the cohorts born after 1960 it increased again, because parity increased more among early mothers.

In sum, changing linkages between first birth postponement and completed fertility among college and postgraduate educated women emerge. First birth postponement among the 'pioneering-postponers' born 1940-1960 was associated with high childlessness, low proportions of higher parity births, and declines in completed parity among mothers, particularly among those who had first children early in the life course, i.e. before age of 25. Next, a second generation or 'modern postponement' regime emerges among tertiary educated women born after 1960. Among these 'modern-postponers' first birth postponement links with decreasing childlessness, higher average parities among mothers, and a convergence of the variance in first birth timing between postgraduate and college educated women.

DISCUSSION AND CONCLUSIONS

First birth postponement and its association with subsequent fertility has received considerable attention in times of educational expansion, rapidly increasing average ages at first birth and declining fertility rates in developed countries (Kohler et al. 2002, Billari et al. 2004). In the U.S., in contrast to many European and Asian nations, the increase of average age at first birth was more modest, and total fertility rates did not decline below replacement until 2011, perhaps explaining why the bulk of literature on linkages between high educational attainment, first birth postponement and subsequent fertility trajectories focuses on the European context. Nevertheless, for US college educated women, childlessness levels of 20% or higher, yet also recent increases in motherhood rates and average parity have been documented (Vere 2007, Shang and Weinberg 2012). The motivation for this paper was to apply the postponement-quantum framework guiding European demographers studying low fertility regimes to a U.S. demographic for which it seems highly relevant. We extend the literature by providing a comprehensive overview of first birth timing, childlessness, completed parity, and the association of first birth timing with completed fertility for US women with postgraduate and college education born between 1920 and 1986+. We also make a case for disaggregating said demographic, with the hypothesis that separating women with postgraduate training would provide even more information about this question. Our findings show that these two groups differ from each other with respect to every aspect of fertility: timing of first birth, childlessness age 40-44, and completed fertility.

How late do highly educated women postpone the first birth, and when may late become too late? While we provide clear answers to the first question, the data we reported above do not provide a clear answer to the second. In fact, while postponement is sustained among U.S. highly educated women, its associations with childlessness and completed parity have changed considerably over cohorts. These changes are consistent with variation in the prevalence of pathways for combining tertiary education and employment with family formation, and changing strategies therein over time, as suggested by Goldin (2004). Our findings on first birth timing and completed parity delineate five distinct postponement phases among postgraduate educated women in the U.S.: 1) The pre-postponement cohorts born between 1920 and 1935 with relatively early first births (median ages of 26), associated with high average parity and low childlessness. 2) The pre-postponement transition birth cohort born 1936-40, featuring among the earliest median age at first birth, yet seeing declines in average parity, regardless of first birth timing (which take place among lower educated women as well, results not shown but available upon request). 3) The 'pioneering postponers' born between 1940 and 1959, displaying significant increases in ages at first birth, paired with further declines in completed parity, and increases in childlessness to peak-levels of 30-33% for women born in the 1950s. 4) The 'modern-postponers' born after 1960 who sustain late median ages at first birth, yet, see increases in higher parity births and average completed parity, and declines in childlessness. Among them, 5) are the birth cohorts born after 1970 who furthermore display a decline in the variance of first birth timing, converging in this respect with college educated women, who have a more condensed first birth time span throughout cohorts.

Additionally, we can offer a refinement with respect to how transitions from one dominant work-family strategy to the next may have looked like, for highly educated women. Goldin's 'family first, job second' strategy for graduation cohorts 1920/25-1940/45 appears to apply to our 'pre-postponement' cohorts born up to 1935. The 1936-40 birth cohort, however, which was the first to gain access to the contraceptive pill (starting in 1965) in their prime fertility years, seems to have had 'family first' and career next, thereby reducing the number of children compared with previous cohorts, so that the childbearing process among highly educated women likely ended at somewhat younger ages than for previous birth cohorts. The cohort born in 1941-45 looks like another transition cohort, the first to begin postponing the first birth, but not yet to the same extend later born cohorts would, while displaying further parity reductions, in particular among mothers who had the first child early in life. Goldin's 'career first, then family' cohorts then fully overlap with our remaining 'pioneering-postponement' cohorts born 1945-59, and we may extend this strategy to 'career first, family (in terms of children) then or not at all', given record levels of childlessness among postgraduate women born in the 1950s. The strategy of 'career and family simultaneously' dovetails with the prevailing behavior of our 'modern-postponers' born after 1960. Yet, highly educated women born in the 1960s may have had a more diverse set of career-family strategies than women born after 1970—as indicated by a larger variance in ages at first birth compared with our youngest birth cohorts. The highly educated birth cohorts born since 1970 hence seem to show an increasing concentration on the strategy 'career and first baby simultaneously sometime between the ages of 28 and 35'. In this context, it remains an open question whether and how much new developments like ART, online dating and changing union formation processes, and increases in longevity may be related to or shape the ongoing changes in fertility behavior we observe.

Thus, first birth postponement is not per se tied to declines in motherhood rates or completed fertility, underscoring that what counts as 'late' depends on context, and that there is no uniform answer to the question of whether and when 'late' becomes 'too late'. Indeed, whether and by how much first birth postponement links to declines in completed fertility has been shown to vary across European countries, with the postponement effect being stronger in low-fertility regimes and in countries where the combination of work and family is most difficult (Billari and Borgoni 2005; Kohler et al. 2002). In the final analysis, our data may indicate that questions of institutional, economic, social, and cultural factors affecting work life balance may be more relevant to understanding fertility transitions than the identification of biological upper limits to postponement.

Finally, our results are in line with and extend findings by Morgan and Rindfuss' (1999) on the decreasing association between first birth timing and (near) completed parity. Using the same CPS data, they show a substantial decrease in parity among mothers with first births before age 25 and more moderate decreases for women with later first births in a pooled sample of all women among birth cohorts 1936-1950. Our results confirm such a more substantial decrease in average parity among early mothers with a first birth before age 25 also among highly educated women. Complementing Morgan and Rindfuss (1999), we show that a continuation of this trend occurred among highly educated mothers up to the birth cohort of 1955, and a reversal for birth cohorts 1956+. Not only has average parity increased for all highly educated mothers regardless of age at first birth in these cohorts, but it has increased more substantially among the early childbearers, indicating a new strengthening of the association between early motherhood and higher completed parity among the highly educated in the birth cohorts 1956+. It is well known that highly educated women have lower completed fertility compared with their lower peers, also in the US (Musick et al. 2009). While first birth postponement, decreased parity due to potential biological age limits, and higher levels of childlessness have been at the forefront of the fertility-high education debate, it is less well known that early mothers have reduced parity more substantially than later age first mothers, in this highly educated segment. Of course there are fewer women with early first births among the highly educated, and flooring effects play a role, because older first time mothers had lower average parity in the 'high fertility' cohorts to begin with. Yet, the fact that declines in fertility or lower fertility among highly educated women may partly be driven by active parity 'control' in general and in particular among early first mothers, may deserve more attention and justify shifting the focus from the 'postponement-catch up' narrative to a general 'parity progression in relation to age at first birth' narrative. Deeper understanding of the associations between first birth timing, birth spacing, and completed parity, require investigating more closely different sequencing strategies of education, family formation, and employment, in particular among highly educated women, and to pay attention to underlying dynamics of couple formation. The cross-sectional CPS data are not informative in this respect. Data containing longitudinal information on educational attainment, employment trajectories, and family formation with large enough sample sizes for highly educated women are currently not available for the U.S.; such data would also allow to explore more fully the differences in family formation timing and strategies between black and white women documented in our findings.

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Tables and Figures

Table 0
Women's' Enrollment in Tertiary Education by Age and Year

Year	Total		White		Black		Total	White	Black
Age	25-29	30-34	25-29	30-34	25-29	30-34		25-34	
1980	8.8	7.0	9.1	7.5	13.0	6.6	15.8	16.6	19.6
1990	10.2	6.9	10.7	7.4	7.3	6.3	17.1	18.1	13.6
1995	12.2	6.5	12.3	6.3	13.0	8.3	18.7	18.6	21.3
2000	12.7	7.7	11.8	7.4	16.7	11.2	20.4	19.2	27.9
2005	14.2	7.9	14.7	7.4	14.2	12.7	22.1	22.1	26.9
2010	15.8	9.9	15.4	9.8	18.8	14.8	25.7	25.2	33.6
2015	14.6	7.7	14.0	7.1	16.3	11.9	22.3	21.1	28.2

source: https://nces.ed.gov/programs/digest/d17/tables/dt17_103.10.asp?current=yes
NCES: National Education Digest 2016

Table 1a
Ages at 25%, 50% (Median Age) and 65% Survival Time to First Birth: ALL WOMEN

	All Women							
	Postgrad.				***College***			
Cohort	Age 25%	Age 50%	Age 65%	Range 25-65 %	Age 25%	Age 50%	Age 65%	Range 25-65%
1921-1925	24	28	32	8	24	27	29	5
1926-1930	23	26	30	7	23	25	27	4
1931-1935	23	26	30	7	22	25	26	4
1936-1940	22	26	29	7	22	24	27	5
1941-1945	23	27	32	9	23	25	28	5
1946-1950	25	30	36	11	24	27	30	6
1951-1955	27	32	38	11	25	29	33	8
1956-1960	28	33	39	11	26	30	34	8
1961-1965	28	32	37	9	26	30	34	8
1966-1970	28	32	36	8	26	30	33	7
1971-1975	28	32	35	7	26	30	33	7
1976-1980	28	32	35	7	26	30	33	7
1981-1985	28	32	n.a.	n.a.	27	31	35	8
1986+	29	n.a.	n.a.	n.a.	27	n.a.	n.a.	n.a.

Table 1b
Ages at 25%, 50% (Median Age)and 65% Survival Time to First Birth: WHITE WOMEN

	White Women							
	Postgrad.				***College***			
Cohort	Age 25%	Age 50%	Age 65%	Range 25-65 %	Age 25%	Age 50%	Age 65%	Range 25-65 %
1921-1925	24	27	31	7	24	27	29	5
1926-1930	23	26	30	7	23	25	27	4
1931-1935	23	26	30	7	22	24	26	4
1936-1940	22	26	29	7	22	24	26	4
1941-1945	24	28	32	8	23	25	28	5
1946-1950	25	30	37	12	24	27	30	6
1951-1955	27	32	39	12	25	29	34	9
1956-1960	28	33	40	12	26	30	34	8
1961-1965	28	33	37	9	27	31	34	7
1966-1970	29	32	36	7	27	30	33	6
1971-1975	28	32	35	7	26	30	33	7
1976-1980	28	32	35	7	26	30	33	7
1981-1985	28	32	n.a.	n.a.	27	31	35	8
1986+	29	n.a.	n.a.	n.a.	27	n.a.	n.a.	n.a.

Table 1c
Ages at 25%, 50% (Median Age)and 65% Survival Time to First Birth: BLACK WOMEN

	Black Women							
	Postgrad.				***College***			
Cohort	Age 25%	Age 50%	Age 65%	Range 25-65 %	Age 25%	Age 50%	Age 65%	Range 25-65 %
1921-1925	23	28	38	15	22	26	28	6
1926-1930	22	26	31	9	22	26	30	8
1931-1935	23	26	30	7	21	25	28	7
1936-1940	20	25	30	10	20	24	26	6
1941-1945	21	25	28	7	21	25	27	6
1946-1950	22	27	34	12	21	25	29	8
1951-1955	24	30	35	11	21	27	33	12
1956-1960	26	32	n.a.	n.a.	23	29	34	11
1961-1965	25	31	36	11	24	29	34	10
1966-1970	25	32	37	12	24	29	34	10
1971-1975	25	32	37	12	22	28	33	11
1976-1980	25	32	38	13	22	29	33	11
1981-1985	25	34	n.a.	n.a.	23	29	n.a.	n.a.
1986+	25	n.a.	n.a.	n.a.	25	n.a.	n.a.	n.a.

Table 2a
Childlessness at Age 44 (Survival Function), all Women

	Postgrad All Women			College All Women		
Cohort	***Estimate***	***CI UB***	***CI LB***	***Estimate***	***CI UB***	***CI LB***
1921-1925	0.277	0.244	0.311	0.172	0.151	0.195
1926-1930	0.227	0.204	0.251	0.140	0.125	0.156
1931-1935	0.241	0.219	0.263	0.115	0.102	0.129
1936-1940	0.225	0.206	0.245	0.132	0.120	0.145
1941-1945	0.269	0.252	0.286	0.151	0.140	0.163
1946-1950	0.308	0.291	0.325	0.222	0.210	0.234
1951-1955	0.311	0.289	0.332	0.272	0.258	0.286
1956-1960	0.329	0.308	0.351	0.253	0.241	0.266
1961-1965	0.266	0.248	0.284	0.231	0.220	0.241
1966-1970	0.235	0.221	0.249	0.205	0.196	0.214
1971-1975	0.215	0.194	0.236	0.193	0.181	0.205
1976-1980	0.230	0.201	0.261	0.204	0.179	0.230

Table 2b
Childlessness at Age 44 (Survival Function), White Women

	Postgrad. White Women			College White Women		
Cohort	***Estimate***	***CI UB***	***CI LB***	***Estimate***	***CI UB***	***CI LB***
1921-1925	0.265	0.231	0.301	0.170	0.148	0.194
1926-1930	0.221	0.196	0.247	0.132	0.117	0.149
1931-1935	0.244	0.220	0.267	0.106	0.093	0.121
1936-1940	0.231	0.210	0.252	0.129	0.116	0.143
1941-1945	0.276	0.258	0.294	0.156	0.144	0.169
1946-1950	0.318	0.300	0.337	0.228	0.215	0.241
1951-1955	0.316	0.293	0.340	0.280	0.265	0.295
1956-1960	0.332	0.308	0.355	0.252	0.237	0.266
1961-1965	0.271	0.251	0.291	0.233	0.221	0.244
1966-1970	0.234	0.219	0.250	0.207	0.196	0.218
1971-1975	0.220	0.198	0.242	0.188	0.174	0.203
1976-1980	0.214	0.181	0.250	0.204	0.174	0.236

Table 2c
Childlessness at Age 44 (Survival Function), Black Women

	Postgrad. Black Women			College Black Women		
Cohort	***Estimate***	***CI UB***	***CI LB***	***Estimate***	***CI UB***	***CI LB***
1921-1925	0.316	0.201	0.437	0.125	0.046	0.246
1926-1930	0.261	0.184	0.345	0.210	0.138	0.292
1931-1935	0.223	0.156	0.298	0.186	0.131	0.250
1936-1940	0.193	0.134	0.261	0.130	0.086	0.184
1941-1945	0.186	0.127	0.254	0.174	0.125	0.231
1946-1950	0.289	0.223	0.357	0.174	0.117	0.240
1951-1955	0.278	0.207	0.354	0.278	0.227	0.330
1956-1960	0.401	0.322	0.480	0.295	0.251	0.339
1961-1965	0.221	0.156	0.294	0.245	0.207	0.286
1966-1970	0.270	0.219	0.323	0.232	0.199	0.267
1971-1975	0.286	0.231	0.343	0.216	0.174	0.261
1976-1980	0.250	0.144	0.370	0.261	0.205	0.319

Table 3: Average Parity among Postgraduate and College Educated Mothers by First Birth Timing and Birth Cohort (all women)

Age at First Birth		**1921-1925**	**1926-1930**	**1931-1935**	**1936-1940**	**1941-1945**	**1946-1950**	**1951-1955**	**1956-1960**	**1961-1965**	**1966-1970**	**1971-1975**
Postgrad.												
<20	Mean	3.50	3.73	3.50	3.39	2.98	2.74	2.23	2.18	2.47	2.70	2.61
	N	*38*	*60*	*105*	*117*	*82*	*70*	*44*	*17*	*30*	*61*	*51*
20-24	Mean	3.14	3.19	3.25	2.83	2.53	2.29	2.15	2.28	2.56	2.39	2.45
	N	*172*	*391*	*451*	*577*	*318*	*249*	*99*	*85*	*181*	*229*	*110*
25-29	Mean	2.87	2.90	2.83	2.40	2.20	2.08	2.23	2.37	2.37	2.40	2.41
	N	*191*	*312*	*384*	*401*	*285*	*301*	*172*	*203*	*349*	*487*	*279*
30-34	Mean	2.47	2.15	2.16	1.76	1.87	1.89	1.96	2.09	2.12	2.12	2.14
	N	*64*	*104*	*138*	*143*	*136*	*170*	*140*	*195*	*360*	*591*	*310*
35-39	Mean	2.00	1.95	1.76	1.67	1.40	1.44	1.68	1.69	1.67	1.73	1.74
	N	*29*	*41*	*45*	*36*	*42*	*57*	*81*	*75*	*179*	*339*	*148*
College												
<20	Mean	3.61	3.81	3.84	3.63	3.12	2.79	2.40	2.56	2.64	2.72	2.96
	N	*57*	*121*	*143*	*195*	*117*	*149*	*78*	*75*	*78*	*177*	*109*
20-24	Mean	3.38	3.54	3.47	3.10	2.73	2.53	2.63	2.39	2.53	2.54	2.59
	N	*299*	*741*	*927*	*1,082*	*559*	*531*	*258*	*280*	*486*	*657*	*285*
25-29	Mean	3.11	3.05	2.86	2.54	2.24	2.19	2.30	2.37	2.41	2.38	2.40
	N	*381*	*619*	*674*	*644*	*537*	*574*	*381*	*637*	*985*	*1,235*	*536*
30-34	Mean	2.31	2.35	2.20	1.89	1.95	1.92	1.97	2.09	2.13	2.05	2.06
	N	*142*	*168*	*144*	*200*	*137*	*206*	*162*	*401*	*761*	*956*	*390*
35-39	Mean	1.80	1.76	1.39	1.56	1.43	1.48	1.54	1.62	1.69	1.64	1.82
	N	*46*	*46*	*41*	*55*	*35*	*75*	*65*	*163*	*310*	*382*	*152*

Figure 1a

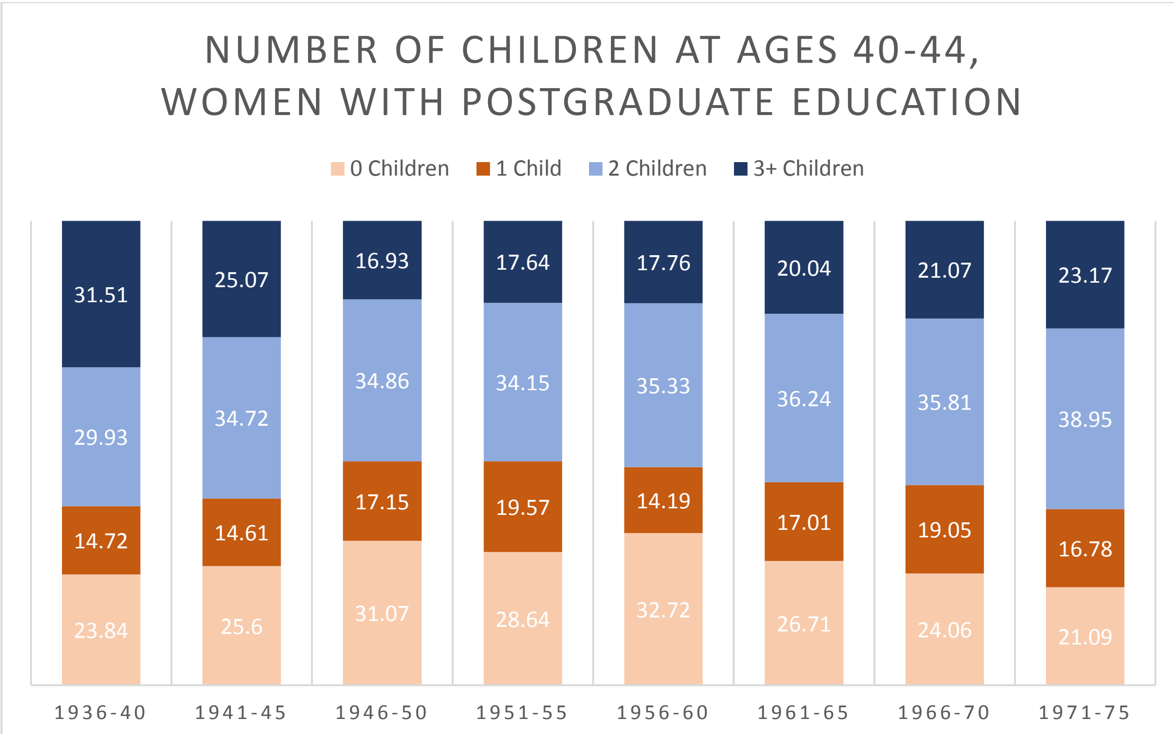


Figure 1b

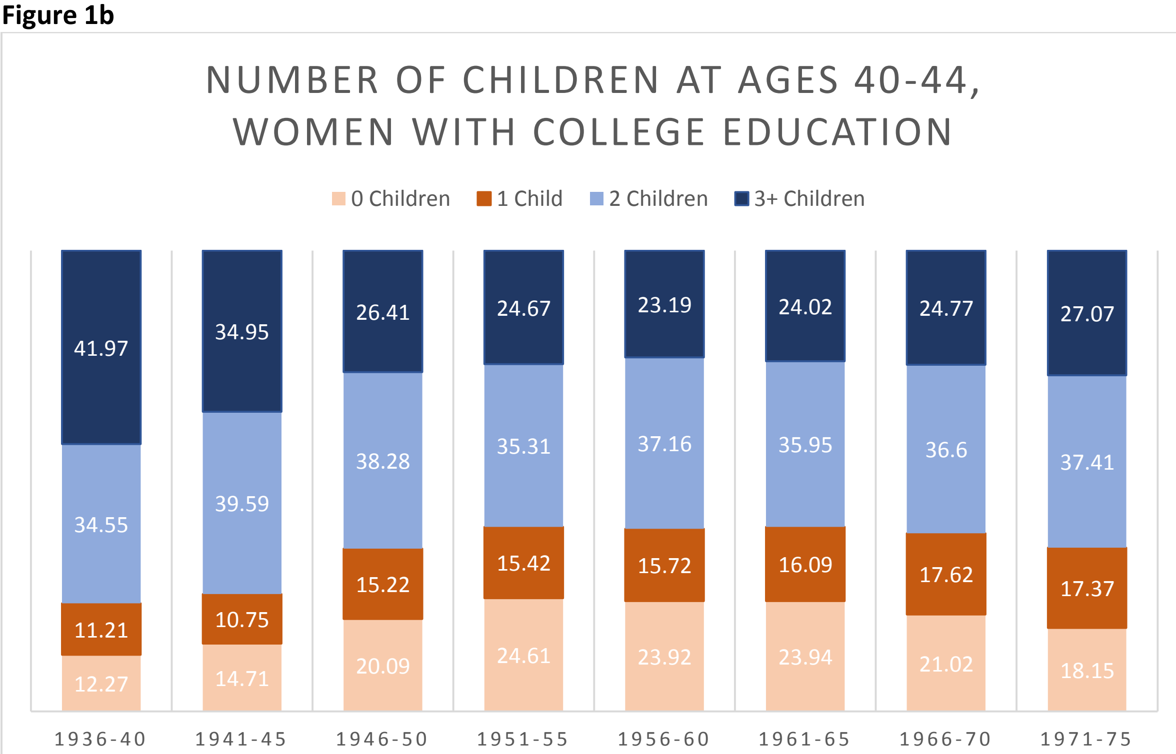
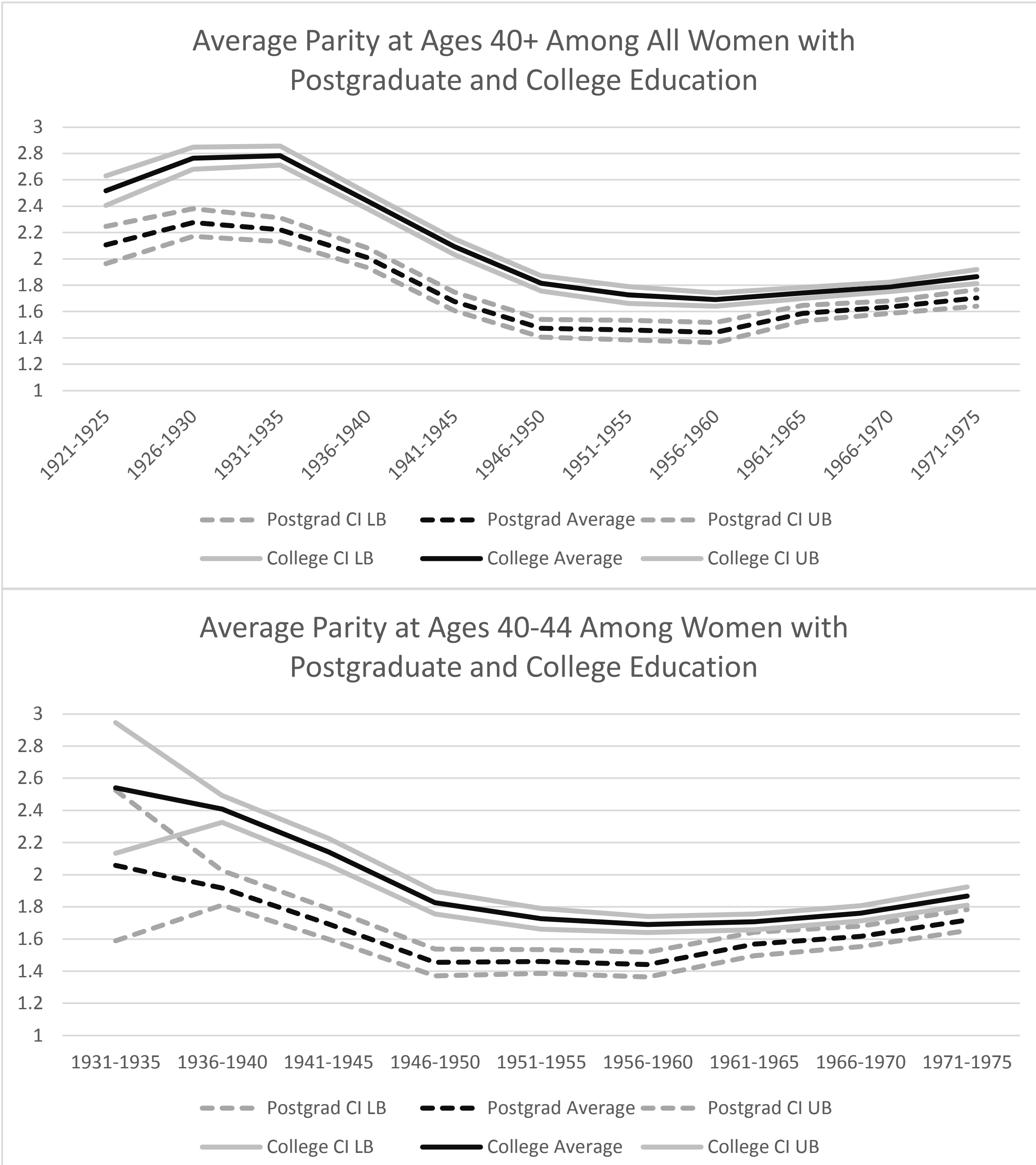


Figure 2


Average Parity at Ages 40+ Among All Women with Postgraduate and College Education
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
1921-1925
1926-1930
1931-1935
1936-1940
1941-1945
1946-1950
1951-1955
1956-1960
1961-1965
1966-1970
1971-1975
Postgrad CI LB
Postgrad Average
Postgrad CI UB
College CI LB
College Average
College CI UB
Average Parity at Ages 40-44 Among Women with Postgraduate and College Education
3
2.8
2.6
2.4
2.2
2
1.8
1.6
1.4
1.2
1
1931-1935
1936-1940
1941-1945
1946-1950
1951-1955
1956-1960
1961-1965
1966-1970
1971-1975
Postgrad CI LB
Postgrad Average
Postgrad CI UB
College CI LB
College Average
College CI UB

APPENDIX

Table A

Sample Size: Women with College and Postgraduate Education in the June CPS 1979-2018

	College			**Postgraduate**			**Total**
Cohort	All Women	White	Black	All Women	White	Black	
1921-1925	1,126	1,066	40	685	618	58	1,811
1926-1930	1,980	1,828	105	1,189	1,049	114	3,169
1931-1935	2,189	1,921	163	1,491	1,302	130	3,680
1936-1940	2,774	2,454	179	1,788	1,565	146	4,562
1941-1945	4,105	3,591	263	2,788	2,514	158	6,893
1946-1950	6,903	6,052	434	4,688	4,184	265	11,591
1951-1955	9,315	8,081	667	4,800	4,257	320	14,115
1956-1960	11,230	9,716	867	3,785	3,280	250	15,015
1961-1965	11,312	9,708	812	4,003	3,399	265	15,315
1966-1970	13,220	11,048	1,045	5,498	4,522	416	18,718
1971-1975	10,893	8,905	862	4,848	3,808	411	15,741
1976-1980	8,963	7,276	752	3,852	3,005	308	12,815
1981-1985	7,086	5,782	524	2,688	2,076	220	9,774
1986+	5,788	4,722	446	1,204	931	81	6,992
Total	96,884	82,150	7,159	43,307	36,510	3,142	140,191

Table B1: **Ages at Survival Times Including Confidence Intervals: ALL WOMEN**

	All Women Postgrad 25 % PE	Postgrad 25 % LB	Postgrad 25 % UB	All Women College 25 % PE	College 25 % LB	College 25% UB
1921-1925	24	23	24	24	23	24
1926-1930	23	23	23	23	23	23
1931-1935	23	23	23	22	22	22
1936-1940	22	22	23	22	22	22
1941-1945	23	23	24	23	23	23
1946-1950	25	25	25	24	23	24
1951-1955	27	27	27	25	25	25
1956-1960	28	28	28	26	26	26
1961-1965	28	28	28	26	26	26
1966-1970	28	28	28	26	26	26
1971-1975	28	28	28	26	26	26
1976-1980	28	28	28	26	26	26
1981-1985	28	28	29	27	26	27
1986+	29	28	29	27	27	28
	All Women Postgrad 50 % PE	Postgrad 50 % LB	Postgrad 50 % UB	All Women College 50 % PE	College 50 % LB	College 50% UB
1921-1925	28	27	28	27	26	27
1926-1930	26	26	27	25	25	25
1931-1935	26	26	27	25	24	25
1936-1940	26	25	26	24	24	25
1941-1945	27	27	28	25	25	26
1946-1950	30	30	31	27	27	27
1951-1955	32	32	32	29	29	29
1956-1960	33	32	33	30	30	30
1961-1965	32	32	33	30	30	31
1966-1970	32	32	33	30	30	30
1971-1975	32	32	32	30	30	30
1976-1980	32	31	32	30	30	30
1981-1985	32	32	33	31	31	31

1986+	n.a.

	All Women Postgrad 65 % PE	Postgrad 65 % LB	Postgrad 65 % UB	All Women College 65 % PE	College 65 % LB	College 65% UB
1921-1925	32	31	35	29	29	30
1926-1930	30	29	31	27	27	28
1931-1935	30	29	31	26	26	27
1936-1940	29	28	30	27	26	27
1941-1945	32	31	33	28	27	28
1946-1950	36	35	38	30	30	31
1951-1955	38	36	40	33	33	34
1956-1960	39	38	n.a.	34	34	35
1961-1965	37	36	37	34	34	34
1966-1970	36	35	36	33	33	34
1971-1975	35	35	35	33	33	33
1976-1980	35	34	36	33	33	34
1981-1985	n.a.	34	n.a.	35	34	n.a.
1986+	n.a.	n.a.	n.a.			

Table B2: **Ages at Survival Times Including Confidence Intervals: WHITE AND BLACK WOMEN**

	White Women Postgrad 25 % PE	Postgrad 25 % LB	Black Women Postgrad 25 % UB	Postgrad 25 % PE	White Women Postgrad 25 % LB	Postgrad 25 % UB	Black Women College 25 % PE	College 25 % LB	College 25% UB	College 25 % PE	College 25 % LB	College 25% UB
1921-1925	24	23	24	23	20	25	24	23	24	22	19	24
1926-1930	23	23	23	22	21	23	23	23	23	22	21	23
1931-1935	23	23	23	23	21	24	22	22	22	21	19	23
1936-1940	22	22	23	20	20	22	22	22	22	20	19	21
1941-1945	24	23	24	21	20	22	23	23	23	21	20	22
1946-1950	25	25	26	22	21	23	24	24	24	21	20	21
1951-1955	27	27	27	24	22	25	25	25	25	21	21	22
1956-1960	28	28	29	26	25	27	26	26	26	23	23	24
1961-1965	28	28	28	25	24	26	27	26	27	24	23	24
1966-1970	29	28	29	25	24	26	27	26	27	24	23	24
1971-1975	28	28	29	25	24	26	26	26	26	22	22	23
1976-1980	28	28	28	25	23	26	26	26	26	22	22	23
1981-1985	28	28	29	25	23	27	27	27	27	23	22	25
1986+	29	28	30	25	21	26	27	27	28	25	24	26

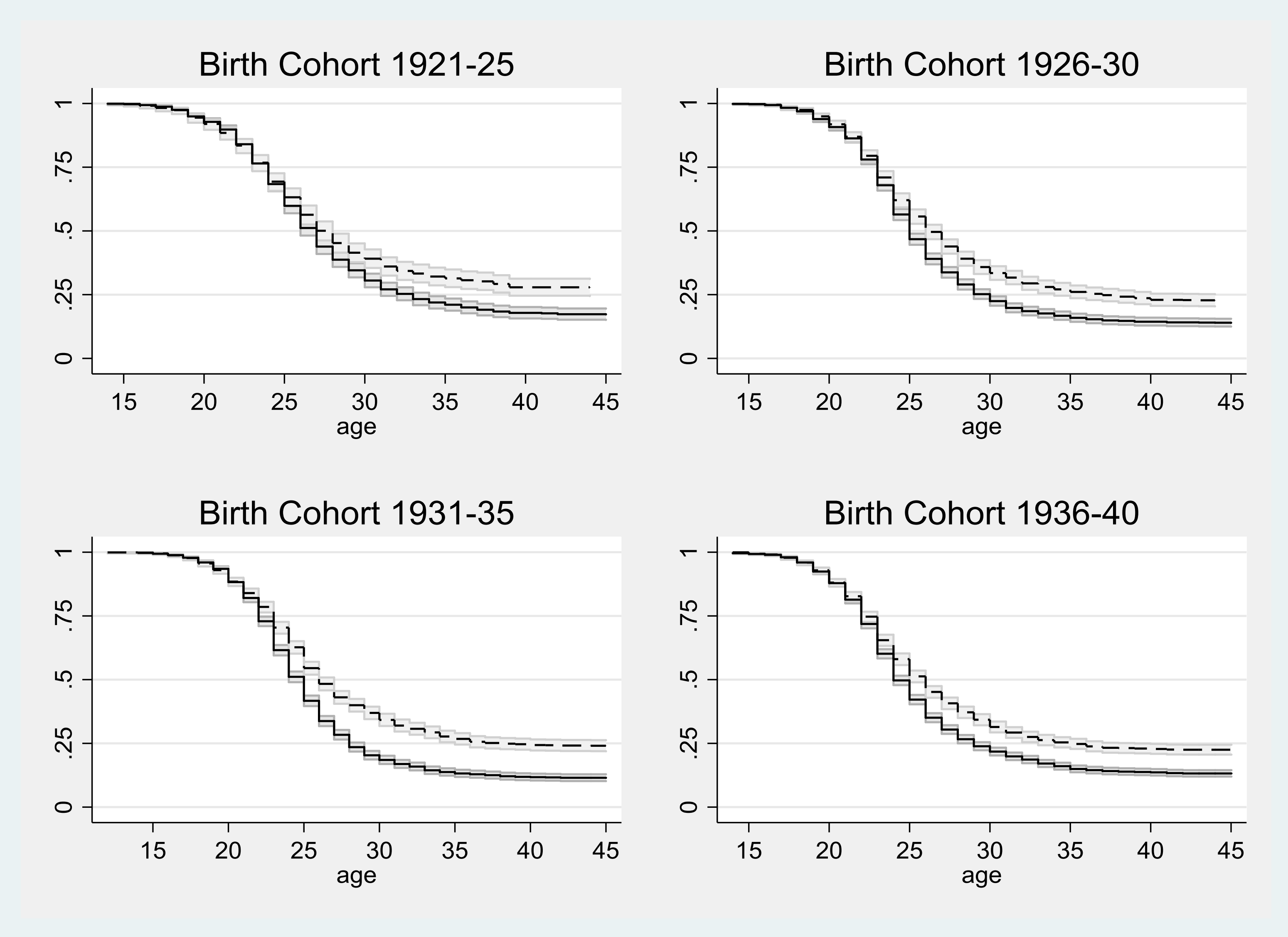
	White Women Postgrad 50 % PE	Postgrad 50 % LB	Black Women Postgrad 50 % UB	Postgrad 50 % PE	White Women Postgrad 50 % LB	Postgrad 50 % UB	Black Women College 50 % PE	College 50 % LB	College 50% UB	College 50 % PE	College 50 % LB	College 50% UB
1921-1925	27	27	28	28	25	37	27	26	27	26	23	28
1926-1930	26	26	27	26	24	28	25	25	25	26	23	29
1931-1935	26	26	27	26	26	28	24	24	25	25	24	26
1936-1940	26	25	26	25	23	27	24	24	25	24	23	25
1941-1945	28	27	28	25	24	27	25	25	26	25	23	25

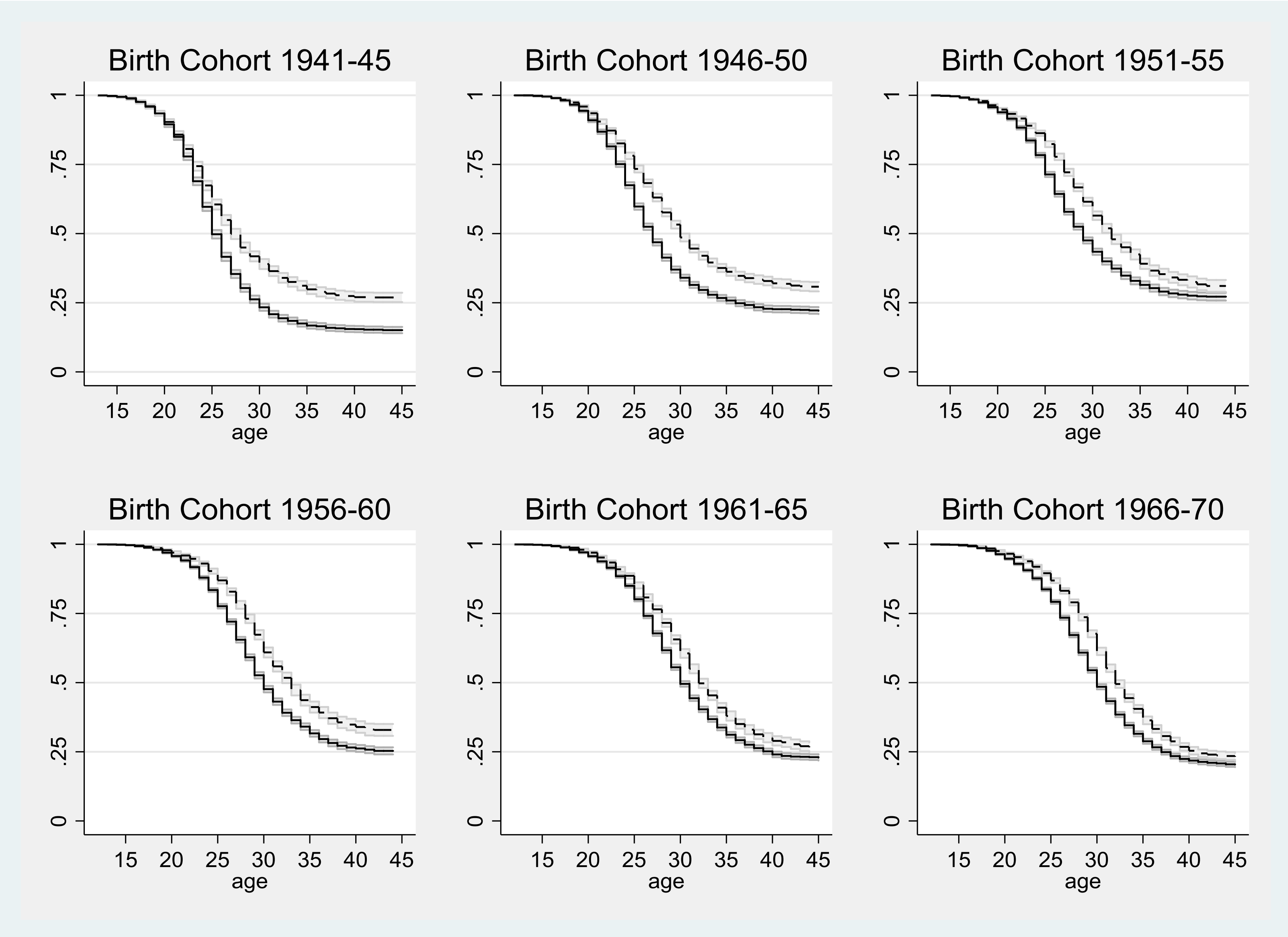
1946-1950	30	30	31	27	25	29	27	27	27	25	24	26
1951-1955	32	32	33	30	28	32	29	29	29	27	26	28
1956-1960	33	33	34	32	30	37	30	30	30	29	28	30
1961-1965	33	32	33	31	29	33	31	30	31	29	28	30
1966-1970	32	32	33	32	30	33	30	30	31	29	28	30
1971-1975	32	32	32	32	30	33	30	30	30	28	27	29
1976-1980	32	31	32	32	30	33	30	30	30	29	28	30
1981-1985	32	32	33	34	30	.	31	31	31	29	28	32
1986+	.	.	.	.	26	.	.	.	.	.	.	.
	White Women Postgrad 65 % PE	Postgrad 65 % LB	Black Women Postgrad 65 % UB	Postgrad 65 % PE	White Women Postgrad 65 % LB	Postgrad 65 % UB	Black Women College 65 % PE	College 65 % LB	College 65% UB	College 65 % PE	College 65 % LB	College 65% UB
1921-1925	31	30	34	38	28	.	29	29	30	28	26	34
1926-1930	30	29	31	31	27	40	27	27	27	30	28	32
1931-1935	30	29	31	30	27	34	26	26	26	28	26	30
1936-1940	29	28	30	30	27	31	26	26	27	26	25	28
1941-1945	32	32	34	28	26	30	28	27	28	27	26	30
1946-1950	37	36	40	34	30	.	30	30	31	29	27	31
1951-1955	39	37	41	35	32	.	34	33	34	33	31	35
1956-1960	40	38	.	.	37	.	34	34	35	34	32	38
1961-1965	37	36	38	36	34	39	34	34	34	34	32	36
1966-1970	36	35	36	37	35	39	33	33	34	34	32	35
1971-1975	35	35	36	37	35	40	33	33	33	33	32	35
1976-1980	35	34	35	38	34	.	33	33	34	33	32	35
1981-1985	.	35	.	.	.	.	35	34	.	.	32	.
1986+	.	.	.	.	.	.	.	.	.	.	.	.

	White Women Postgrad 50 % PE	Postgrad 50 % LB	Black Women Postgrad 50 % UB	Postgrad 50 % PE	White Women Postgrad 50 % LB	Postgrad 50 % UB	Black Women College 50 % PE	College 50 % LB	College 50% UB	College 50 % PE	College 50 % LB	College 50% UB
1921-1925	27	27	28	28	25	37	27	26	27	26	23	28
1926-1930	26	26	27	26	24	28	25	25	25	26	23	29
1931-1935	26	26	27	26	26	28	24	24	25	25	24	26
1936-1940	26	25	26	25	23	27	24	24	25	24	23	25
1941-1945	28	27	28	25	24	27	25	25	26	25	23	25
1946-1950	30	30	31	27	25	29	27	27	27	25	24	26
1951-1955	32	32	33	30	28	32	29	29	29	27	26	28
1956-1960	33	33	34	32	30	37	30	30	30	29	28	30
1961-1965	33	32	33	31	29	33	31	30	31	29	28	30
1966-1970	32	32	33	32	30	33	30	30	31	29	28	30
1971-1975	32	32	32	32	30	33	30	30	30	28	27	29
1976-1980	32	31	32	32	30	33	30	30	30	29	28	30
1981-1985	32	32	33	34	30	.	31	31	31	29	28	32
1986+	.	.	.	.	26	.	.	.	.	.	.	.
	White Women Postgrad 65 % PE	Postgrad 65 % LB	Black Women Postgrad 65 % UB	Postgrad 65 % PE	White Women Postgrad 65 % LB	Postgrad 65 % UB	Black Women College 65 % PE	College 65 % LB	College 65% UB	College 65 % PE	College 65 % LB	College 65% UB
1921-1925	31	30	34	38	28	.	29	29	30	28	26	34
1926-1930	30	29	31	31	27	40	27	27	27	30	28	32
1931-1935	30	29	31	30	27	34	26	26	26	28	26	30
1936-1940	29	28	30	30	27	31	26	26	27	26	25	28
1941-1945	32	32	34	28	26	30	28	27	28	27	26	30
1946-1950	37	36	40	34	30	.	30	30	31	29	27	31
1951-1955	39	37	41	35	32	.	34	33	34	33	31	35

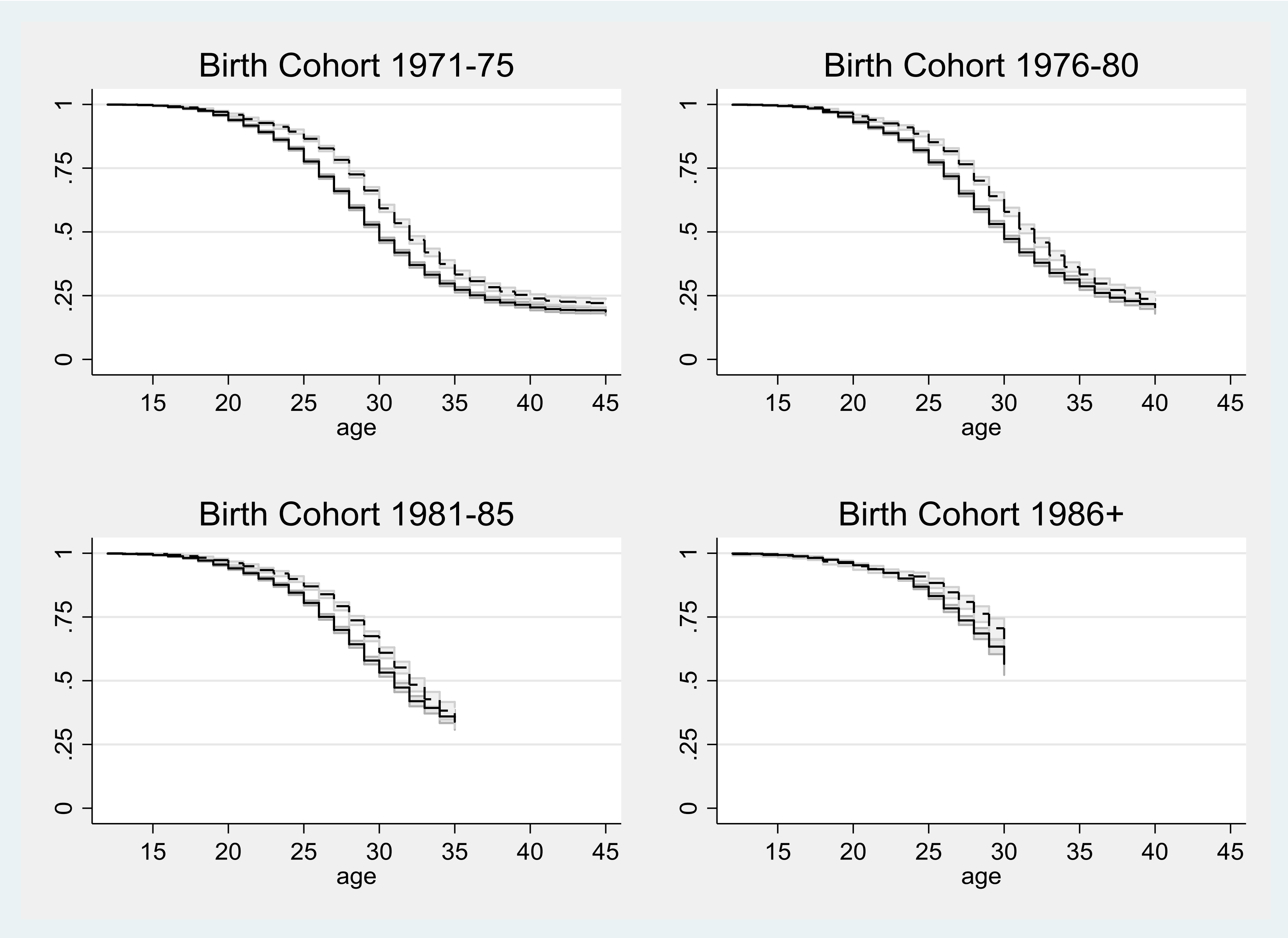
1956-1960	40	38	.	.	37	.	34	34	35	34	32	38
1961-1965	37	36	38	36	34	39	34	34	34	34	32	36
1966-1970	36	35	36	37	35	39	33	33	34	34	32	35
1971-1975	35	35	36	37	35	40	33	33	33	33	32	35
1976-1980	35	34	35	38	34	.	33	33	34	33	32	35
1981-1985	.	35	.	.	.	.	35	34	.	.	32	.
1986+	.	.	.	.	.	.	.	.	.	.	.	.

Figure Panel A: First Birth Survival Functions for Postgraduate Educated Women (dashed lines) and College Educated Women (solid lines)





Birth Cohort 1941-45
Birth Cohort 1946-50
Birth Cohort 1951-55
Birth Cohort 1956-60
Birth Cohort 1961-65
Birth Cohort 1966-70
0 .25 .5 .75 1
15 20 25 30 35 40 45
age


Birth Cohort 1971-75
Birth Cohort 1976-80
Birth Cohort 1981-85
Birth Cohort 1986+
0
.25
.5
.75
1
15
20
25
30
35
40
45
age