Why Have Divorce Rates Fallen? The Role of Women's Age at Marriage

Dana Rotz*
Mathematica Policy Research

November 2012

Abstract

American divorce rates rose from the 1950s to the 1970s, peaked around 1980, and have fallen ever since. The mean age at marriage also substantially increased after 1970. Using data from the Survey of Income and Program Participation, 1979 National Longitudinal Survey of Youth, and National Survey of Family Growth, I explore the extent to which the rise in age at marriage can explain the rapid decrease in divorce rates for cohorts marrying after 1980. Three different empirical approaches all suggest that the increase in women's age at marriage was the main proximate cause of the fall in divorce.

*Email: drotz@mathematica-mpr.com. I would like to thank Roland Fryer, Claudia Goldin, and Larry Katz for continued guidance and support on this project, as well as Timothy Bond, Richard Freeman, Stephanie Hurder, Jeff Liebman, Claudia Olivetti, Amanda Pallais, Laszlo Sandor, Emily Glassberg Sands, Alessandra Voena, Justin Wolfers, and seminar participants at Case Western Reserve University, Harvard University, Mathematica Policy Research, UCLA, University of Arizona, University of Illinois-Chicago, University of Iowa, University of Texas-Austin, and the US Census Bureau for helpful comments and discussions. I am also grateful to Larry Katz and Phillip Levine for providing data on oral contraceptive pill access and abortion rates respectively. All remaining errors are my own. This research has been supported by the NSF-IGERT program, "Multidisciplinary Program in Inequality and Social Policy" at Harvard University (Grant No. 0333403). The views expressed herein are those of the author and not necessarily those of Mathematica Policy Research.

1 Introduction

Between 1950 and 1979, divorce rates more than doubled in the United States. Only one-quarter of the marriages that started in the 1950s ended in divorce. But half of all unions beginning in the 1970s would eventually dissolve. Divorce rates, however, soon began to fall back to previous levels. American couples marrying in 2008 are projected to divorce about 40 percent less often than those who wed at the height of marital instability.

Many studies have tried to explain the initial rise in divorce rates.[1] Decreases in marital stability have been linked to decreases in occupational segregation by gender, the rise of the welfare state, household technological progress, and changing social attitudes toward divorce.[2] Several authors have also worked to uncover a connection between family law and divorce rates.[3] Others have focused on the relationship between divorce and female labor force participation or wages.[4]

Despite the substantial attention given to the rise in divorce, there is a dearth of information on why marriages subsequently became more stable. The leveling and decline of divorce has been documented and some authors have discussed potential reasons for the downward trend.[5] But the change remains unexplained.

In this paper, I demonstrate that increases in age at marriage must be a key part of any explanation for the decrease in divorce rates after 1980. Indeed, holding a bride's age constant, marriages beginning from 1980 to 2004 are at equal risk of divorce. Thus, age at

[1] See Stevenson and Wolfers (2007) for a survey.

[2] See McKinnish (2007), Moffitt (1997), Greenwood and Guner (2008), Greenwood, Seshadri, and Yorukoglu (2005), and Thornton (1989) respectively.

[3] See Friedberg (1998), Parkman (1992), Peters (1986), and Wolfers (2006).

[4] See Becker (1973, 1974, 1991), Johnson and Skinner (1986), Oppenheimer (1997), Ruggles (1997), and Weiss and Willis (1997).

[5] Goldstein (1999), Kreider and Ellis (2011), and Stevenson and Wolfers (2007, 2011) all document the trend in divorce rates. Isen and Stevenson (2010), Neeman, Newman, and Olivetti (2008), Rasul (2006), and Stevenson and Wolfers (2007) provide various hypotheses for the causes of the trend, although none of these have been formally tested. Goldin and Katz (2002) and Mechoulan (2006) also propose potential explanations for the decline and demonstrate that access to birth control and divorce laws (respectively) may play a role in explaining the fall in divorce.

marriage can statistically explain the fall in divorce.

For age at marriage to actually explain this change in divorce rates, increases in brides' ages must cause decreases in divorce. Many reasons could justify such a relationship. Older brides have spent more time in the marriage market and thus are better informed about their options and optimal mate. Waiting to marry may also lessen a woman's incentive to search for a new partner during marriage, as a wife's outside options could deteriorate with age.

After I first eliminate selection-based explanations for the decrease in divorce, I use several econometric techniques to provide evidence that the rise in age at marriage caused the change in divorce rates. I use three different empirical strategies to explore the potential for a causal relationship between a bride's age and her risk of divorce. All estimates suggest that age at marriage and divorce are robustly correlated and, under certain conditions, can be said to be causally linked.

The first method controls for the driving forces behind family change at the state-year level to determine the extent to which omitted variables may lead to a spurious relationship between age at marriage and divorce.[6] My results suggest that this bias is limited. Moreover, further analysis shows that if observable variables are at least one-quarter as important as unobservable variables are in predicting age at marriage, then increases in age at marriage cause decreases in the probability of divorce.

A second analysis uses the marital histories of sisters to determine if differences in family background bias estimates of age at marriage's effect on divorce. If the family accounts for a large proportion of the variation in marital stability and a small proportion of the variation in age at marriage, these results suggest a causal relationship between age at marriage and divorce.

I also use state minimum age at marriage laws as instrumental variables (IVs) to more sharply pin down the causal effect of early teenage marriage on divorce. If these laws are

[6] See Stevenson and Wolfers (2007) for a summary of these factors.

binding for some teens but changes in the laws do not otherwise influence divorce rates, the IV procedure will estimate a local average treatment effect (LATE) of early marriage.

All of the above analyses point to the same conclusion: uncorrected estimates do not largely overstate the relationship between age at marriage and divorce. Thus, if estimates are mainly biased because of omitted (measurable) variables that cause changes in family formation or if a bride's family accounts for a large proportion of the variation in divorce risk but a small proportion of the variation in age at marriage or if the IV estimator is valid, then my results demonstrate that increases in age at marriage caused a large portion of the fall in divorce from 1980 to 2004. All estimates suggest that age at marriage can explain 60 percent or more of the decline. That is, although factors such as female labor force participation (see Neeman, Newman, and Olivetti 2008) and access to reproductive technology (as in Akerlof, Yellen, and Katz 1996 or Goldin and Katz 2002) surely caused changes in the family, these and other driving forces largely impacted divorce rates from 1980 to 2004 by changing age at marriage. Given the literature on changes in the family, my results suggest that decreases in the gains to marriage led to increases in age at marriage, which in turn drove down the divorce rate for cohorts marrying from 1980 to 2004. Thus, although many different economic and social changes can be considered important distal causes of the fall in divorce, I demonstrate that the rise in age at marriage is the main proximate cause of divorce's decline.

2 Age at Marriage and Divorce

The mean age at first marriage began to rise rapidly and saliently in America around 1970, as depicted in Figure 1. The average age of first-time brides increased by almost five years from 1970 until the early 2000s; first-time grooms also married more than four years later in 2000 than they did in 1970.[7] Additionally, Figure 1 demonstrates that as age at marriage

[7] The change in age may be slightly overstated in the SIPP before 1960 due to selective mortality; however, most of the change is concentrated after 1960, when selective mortality is relatively unimportant. Estimates of

began to increase, so too did divorce rates.

The women who wed as age at marriage began to rise experienced higher divorce rates than any other marriage cohort in the past 60 years. To examine both the rise and fall of marital instability, Figure 2 depicts the trend in divorce for marriages beginning from 1950 to 2004, derived from a Cox hazard regression of the form

$$\log h_i(t) = \log h(t) + \delta_{iy} + \beta X_i + \varepsilon_{it}. \tag{1}$$

Woman i's hazard of divorce after t years of marriage (the risk of divorce in the t^{th} year of marriage) is $h_i(t)$, δ_{iy} is a vector of variables indicating the year (in five-year groups) that a woman first married, and X_i is a vector of other control variables. The specification allows for a fully flexible hazard rate across the duration of a marriage but requires that covariates have the same proportional effect on the hazard of divorce for all t. I focus my analysis on divorce by year of marriage using the retrospective accounts of women's first marriages commencing from 1950 to 2004, reported in the 2001, 2004, and 2008 panels of the Survey of Income and Program Participation (SIPP).[8]

Figure 2 shows estimates of the relative hazard of divorce by marriage cohort, $h_y = \exp(\delta_y)$, from regressions controlling only for year of marriage ($h_y = 1$ for marriages beginning from 1975 to 1979). Couples marrying between 1970 and 1984 faced the highest divorce rates. Marriages beginning both before and after this period were more stable, with unions beginning in the late 1990s and early 1960s dissolving at similar rates.

average age at marriage using data from the 1960-1980 Censuses demonstrate this effect (see Figure 1).

Changes in age at marriage occurred across all age quantiles, causing a shift in the variable's distribution. See Stevenson and Wolfers (2007) for a discussion of the causes of these changes.

Key papers providing explanations for trends in age at marriage using a myriad of factors include: Akerlof, Yellen, and Katz (1996), Bitler, et al. (2004), Becker (1973, 1974, 1991), Brien, Lillard, and Stern (2006), Ellwood and Bane (1985), Goldin and Katz (2002), Gould and Passerman (2003), Loughran (2002), and Mechoulan (2006).

[8]See Appendix A.1 for details. The following analyses focus on the age of *women* at marriage and the divorce rate for *first marriages*. The SIPP does not report age at marriage for both spouses unless a marriage remains intact. Using male age at first marriage yields largely similar results.

Trends in the relative hazard of divorce are very different when one holds age at marriage constant, as shown by the second line in Figure 2. Given the large increase in the age at marriage (see Figure 1) and previous findings demonstrating a negative relationship between bride's age and divorce risk (e.g., Becker, Landes, and Michael 1977, Teachman 2002, Lehrer 2008, and Lehrer and Yu 2012), it is not surprising that the age-adjusted and unadjusted trends diverge. Although divorce propensities still increase for marriages beginning from 1950 to 1979, there is no longer a subsequent decrease in stability once one controls for age effects. Thus, the increase in age at marriage statistically explains the decrease in divorce for women first marrying from 1980 to 2004.[9]

The rise and fall in divorce was widespread within the US and occurred across many groups of women.[10] In all large racial, educational, and geographic subgroups, controlling for age at marriage mitigates the decline in divorce from 1980 to 2004. For whites, noncollege graduates, those living in urban areas, and those from both liberal and conservative states, the hazard rate of divorce conditional on age at marriage is roughly constant or increasing from 1980 to 2004. Age at marriage has a weaker effect on Hispanics and college graduates; the age-adjusted divorce rate in these groups decreased during the 1990s, though the change was smaller than that suggested by the uncorrected trend.

A nonparametric function relating age at marriage to divorce demonstrates how powerful a bride's age is in predicting her marriage's stability.[11] Figure 3 shows the hazard of divorce by age at marriage (relative to age 22) in the SIPP, controlling for year of marriage

[9]Trends both with and without age controls are robust to different specifications of the hazard function. More flexibly analyzing divorce rates for couples in the n^{th} year of marriage also yields similar conditional and unconditional trends.

[10]Although I examine only those living in the US, Americans are not alone in experiencing increasing age at marriage and marital stability after 1980. The United Nations (2009) provides measures of the singulate mean age at marriage (calculated using the marital status of a country's population by age to estimate the average number of years a member of the population was single) and divorce rate around 1980 and 2004 for 28 OECD countries. In each country, age at marriage rose over the given period, by between 0.7 (Norway) and 7.4 years (Belgium). Divorce rates also decreased in many of these countries throughout this time (e.g., Canada, Germany, and the United Kingdom). However, no statistically significant relationship exists between the change in age at marriage and the change in divorce rates cross-nationally.

[11]See Lehrer (2008) and Lehrer and Yu (2011) for more detailed discussions of this relationship.

fixed-effects and other observable characteristics.[12] The curve is both decreasing and convex, as initially suggested by Becker, Landes, and Michael (1977). Marriages beginning when a bride is 18 are twice as likely to end in divorce than those starting when a woman is 22. Brides in their mid-30's have marriages four times as stable as teenage brides.[13]

2.1 Decomposing the Determinants of Divorce

Combining the coefficients from estimates of eq. (1) with the change in the vector of explanatory variables reveals the relative contribution of various factors to the decline in divorce rates. I use these estimates in Table 1 to decompose the actual change in divorce from 1980 to 2003 into components predicted by changes in age at marriage, predicted by changes in other observables, and not predicted by the included variables.[14] Decompositions of changes in the divorce rate from 1980 to 1995 or 2000 yield largely similar results.

On average, first marriages starting in 1980 have a divorce hazard rate about 37 log points higher than those that began in 2003. Teens comprised only 15 percent of first-time brides in 2003 but about 40 percent of brides in 1980. Because women who marry as teens divorce far more often than those who wait to marry, the change accounts for almost half of the fall in the average hazard of divorce. Other increases in age at marriage imply further declines in divorce, with changes in age explaining 80 percent of the total change in the hazard rate.

Brides were more educated in 2003 than in 1980, but the increase in female education

[12] Controls include indicators for urban location and census division at interview, education at marriage in four groups, being black, white, Hispanic, or another race, and having children prior to marriage.

[13] The convexity of the relationship also suggests caution when interpreting a coefficient on a linear variable for age at marriage.

Further analysis of the relationship between brides' ages and divorce rates indicates that age at marriage has a roughly constant effect across marriage cohorts when one holds constant the distribution of age at marriage (as in Dinardo, Fortin, and Lemieux 1996). Moreover, one can show that marriages beginning earlier in life have higher divorce rates early in marriage. But after a couple's tenth anniversary, age at marriage becomes less predictive of divorce.

[14] Age at marriage jumps from 2003 to 2004 in my SIPP panels, although it is not clear if this change is real or due to sampling error or changes in methodology. Thus, I consider the change from 1980-2003, instead of 1980-2004.

does not imply a large decline in divorce by itself. The doubling of the proportion of brides with a college degree only yields a decrease in the hazard rate of 5.4 log points. The hazard rates associated with all other levels of education are approximately the same. Thus, the increased education of brides only accounts for about 15 percent of the change in divorce rates from 1980 to 2003.

The changing racial composition of married families also predicts a notable component of the change in the hazard rate. The proportion of Hispanic brides more than doubled from 1980 to 2003, implying a 6 log point decrease in overall divorce hazards. Additionally, women who enter a (first) marriage with a child have higher divorce rates than those who do not. Women with children increased from 14 to 28 percent of first-time brides and thus divorce hazard rates fell 4.5 log points less than they otherwise would have. Together, the observable variables predict a decrease in divorce from 1980 to 2003 approximately equal to the actual change.

This decomposition is robust to using male reports of (own) age at first marriage and divorce or alternative datasets, e.g., the National Survey of Family Growth (NSFG).[15] Moreover, although one cannot observe the characteristics of both husbands and wives in the SIPP, using the NSFG to include demographic controls for both spouses leads to similar decompositions. Measurable demographic characteristics can only explain about 30 percent of the change in divorce rates from 1980 to 2004. But age age marriage can account for nearly the entire drop.

2.2 Younger Brides Differ from Older Brides

The decomposition in Table 1 may tempt one to conclude that changes in the age at marriage caused most of the decline in divorce. But the relationship between these variables cannot be taken as causal without further thought. Differences between women who wait to marry

[15] See Appendix A.3 for details.

and those who do not could be driving the correlation.

The SIPP demonstrates that women who marry for the first time later in life are more educated; controlling for marriage cohort effects, the rate of college graduation increases by 1.5 percentage points if one considers a group of brides who are one year older. Later weddings are also more likely to involve blacks and women with children. As college-graduates have lower rates of divorce than others, this difference reinforces a positive association between age at marriage and marital stability. High rates of divorce among black women and women with children before marriage might temper this relationship.

Although far smaller than the SIPP, the NSFG reveals further differences between younger and older brides.[16] In this dataset, waiting one additional year to marry is associated with a 1.4 percentage point increase in the probability of premarital cohabitation and a 2 percentage point decrease in the probability of a shotgun wedding.[17] Moreover, as a woman's age at marriage increases, spouses' ages move closer together but fewer husbands and wives have the same educational attainment. Younger brides are also more religious and more likely to be Catholic.[18] These correlations further suggest the potential for bias in estimates of age at marriage's effect on divorce.

3 The Direct Impact of Age at Marriage on Divorce

Consider the following hypothetical experiment, which would allow one to estimate the unbiased, causal relationship between a bride's age and her marriage's stability. Suppose that a woman selects her husband from a pool of men. If she chooses a spouse when she is older, she may make a better-informed decision. Alternatively, she may behave differently within her marriage if she waits to make her choice (i.e., older brides may have more limited out-

[16] See Appendix A.3 for details.

[17] Defined as a couple marrying zero to eight months prior to a woman's first birth.

[18] Religiousity from the National Longitudinal Survey of Youth (see Appendix A.2), measured using frequency of worship.

side options or greater ability to negotiate disagreements). These effects imply that marital stability rises with age at marriage.

If one could manipulate when a woman selects her husband, one could then simply compare the stability of marriages randomly chosen to start at earlier or later ages. Such an experiment is, of course, infeasible. But comparing women who are very similar (and likely have the same requirements for a spouse) or those that marry at different ages for exogenous reasons will allow one to closely approximate the estimates from this ideal experiment (for some group of women).

3.1 Selection into the Marriage Market

Interpreting this experiment requires that no matter when a woman is given the chance to marry, she chooses a spouse from her set of potential mates. However, women selected to choose a husband at older ages may decide not to marry at all (and thus will never divorce). Therefore, before considering the relationship between age at marriage and divorce, I first explore the potential for changing selection into marriage to influence the divorce rate.

Because only relatively few women choose to never marry, a bounding exercise can be very useful in determining the effect of selection into marriage on divorce rates (c.f., Manski, et al. 1992). One assumes that the probability of divorce for never-married women is one or zero and then calculates the resulting divorce rates. If these women married, the true divorce rate that would result must lie within these bounds. For this exercise, I assume anyone observed unmarried at age 45 will opt out of the marriage market.

Figure 3 plots the trends derived from this exercise, focusing on the probability of divorce before one's tenth anniversary.[19] Both the lower and upper bound trends demonstrate a substantial rise in divorce before 1980 and a subsequent, non-trivial fall. This suggests that

[19] I use the distribution of year of marriage by year of birth for those who marry to allocate never-married women to dates of marriage.
Similar results hold if one focuses on different anniversaries or different cut-off ages.

selection into marriage does not drive the decrease in divorce.[20]

Similarly, one might be concerned that changes in the type of selection into the marriage market from 1980 to 2004 drove the divorce rate down. That is, if the women who previously opted out of the marriage market in the 1980s would have had relatively stable marriages, but the women opting out more recently would have had relatively unstable marriages, selection could cause changes in divorce even if the marriage rate remained constant. To address this potential threat, I use the SIPP to estimate the characteristics (race, education, urban location, and presence of children) of men and women in the marriage market. Defining a woman's marriage market by her state of birth, I control for the average characteristics of men and women choosing to first marry in the year that a given woman first married. This should capture the changing demographic profile of those choosing to wed. Additionally, I control for the average characteristics of never married men and women in the year before a woman's marriage. These variables allow me to condition on the types of men and women eligible to enter the marriage market for the first time. Adding both sets of controls to eq. (1) explains only a small fraction of the fall in divorce from 1980 to 2004.

A related concern involves differences in the sex ratio. If the balance of single, marriageable men and women changed, one could also see shifts in divorce related to sample selection (c.f., Angrist 2002, Grossbard-Shechtman 1993, Guttentag and Secord 1983). To address this concern, I measure the sex ratio in a variety of different ways and control for these variables in my divorce regressions.[21] The trend in divorce risk conditional on these ratios is nearly identical to that derived from regressions not controlling for the relative supply of brides and grooms. Moreover, controlling for age at marriage has the same effect on divorce trends conditional and unconditional on various measures of the sex ratio.

Finally, one might also worry that the rise in cohabitation influenced divorce rates via

[20]My IV technique also employs variation unrelated to eventual marriage rates and thus will not capture the selection effect.

[21]I construct the sex ratio in a variety of different populations. For a woman of age a, I define several

changes in selection (c.f., Brien, Lillard, and Stern 2006). Couples may eschew marriage in favor of cohabitation when they are less certain of the quality of their match. Therefore, growth in cohabitation could result in differential selection into marriage, thus impacting divorce rates.

To assess this source of bias, I turn to the 1988-2008 NSFG.[22] These surveys include information on both dates of marriage and dates of cohabitation, though one must restrict analyses to relationships beginning after 1980. I use the NSFG to analyze overall trends in the dissolution of first unions. That is, I treat any coresidential union as a "marriage" and plot the resulting trend in "divorce." If substitution from marriage to cohabitation drove the decline in divorce from 1980 to 2004, the trend in "divorce rates" for all unions should be far flatter than that for formal marriages.

I examine the trends in relative divorce risk for all first unions, first unions lasting more than one year, and first (formal) marriages in Figure 5. The same fall in divorce rates may be seen for each categorization of unions. Moreover, controlling for the age when one entered their first union leads all of the considered trends to flatten. These findings thus suggest that growth in couples' selection of cohabitation over marriage cannot explain the fall in divorce.[23]

---

measures of the sex ratio, including:

$$\begin{aligned}
SR_1 &= \frac{\text{Number of single men age } a-1 \text{ to } a+1}{\text{Number of single women age } a-1 \text{ to } a+1} \\
SR_2 &= \frac{\text{Number of single men age } a+1 \text{ to } a+3}{\text{Number of single women age } a-1 \text{ to } a+1} \\
SR_3 &= \frac{\text{Number of single men over 15}}{\text{Number of single women over 15}} \\
SR_4 &= \frac{\text{Number of single men over 15 within the woman's racial and educational group}}{\text{Number of single women over 15 within the woman's racial and educational group}} \\
SR_5 &= \frac{\text{Number of men age } a+1 \text{ to } a+3}{\text{Number of women age } a-1 \text{ to } a+1}
\end{aligned}$$

[22] See Appendix A.3.

[23] Additionally, controlling for premarital cohabitation in regressions predicting divorce risk does not influence the shape of conditional and unconditional divorce trends.

These analyses indicate that selection is not a likely driving force behind the fall in divorce rates. I therefore proceed to analyze the relationship between age at marriage and divorce within the ever-married population.

3.2 Controlling for Factors Influencing Family Structure

Extensive research has focused on measuring the impact of various forces on both age at marriage and divorce. Authors have linked changes in the labor market to trends in both variables.[24] Increases in the availability of contraception and abortion have also been connected to different choices made by the family.[25] Moreover, researchers have found relationships between age at marriage, divorce rates, and factors as diverse as welfare provision, household technological progress, family law, and social norms.[26]

These forces could potentially introduce a spurious correlation between age at marriage and divorce, biasing estimates of the causal effect of age at marriage on divorce. To reduce this bias, I estimate regressions of the form

$$\log h_i(t) = \log h(t) + \beta X_i + \delta_{iy} + \theta_{is} + \alpha Age_i + \gamma C_{isy} + \varepsilon_{ist}$$

where C_{isy} is a vector of the variables thought to influence family structure, measured at the state of birth (s) by year of marriage (y) level. The vector includes measures of access to abortion, access to oral contraceptives, rates of cohabitation, Comstock laws (limiting the distribution of contraceptives), female labor force participation, the gender gap in wages, occupational segregation by gender, unilateral divorce legislation, welfare generosity, and

[24] See Becker (1973, 1974, 1991), Gould and Passerman (2003), Johnson and Skinner (1986), Loughran (2002), Oppenheimer (1997), Ruggles (1997), and Weiss and Willis (1997).

[25] See Akerlof, Yellen, and Katz (1996) and Goldin and Katz (2002).

[26] See Bitler, et al. (2004), Ellwood and Bane (1985), Hoynes (1996), Moffitt (1997) on welfare; Greenwood and Guner (2008) and Greenwood, Seshadri, and Yorukoglu (2005) on household technological progress; Friedberg (1998), Mechoulan (2006), Parkman (1992), Peters (1986), Rasual (2006), and Wolfers (2006) on family law; and Cherlin (2004) and Thornton (1989) on social norms.

male wage inequality.[27]

I estimate the effect of age at marriage on the log hazard rate of divorce (α) separately using the entire SIPP sample and the limited number of state-year variables available from 1950 to 2004 (Table 2A) and the period in which all the C_{isy} variables can be matched to the SIPP (1968-2004, Table 2B). All specifications indicate that waiting one extra year to marry is associated with a 9 to 10 percent lower hazard rate of divorce.[28] Adding individual-level controls decreases the estimate of α (in absolute value) by about 1 percentage point. But the inclusion of the C_{isy} terms does not change the coefficient on age at marriage in a meaningful way. Similar results hold when one uses several dummy variables for age at marriage instead of a single, continuous variable.

Though the inclusion of C_{isy} does not affect $\alpha,$ these variables do predict both age at marriage and divorce. One can reject a hypothesis of $\gamma = 0$ at the 5 percent level.[29] The full set of state-year variables also predicts almost one-third of the 4.9 year change in women's age at marriage from 1968 to 2003. The more limited set of variables can explain 10 percent of the 5.7 year change in bridal age from 1950 to 2003.

Three potential factors likely lead the impact of age at marriage on divorce to remain constant across the specifications. First, omitting some of the C_{isy} variables likely biased α upward, while the omission of others biased α downward. Together, the effects cancelled each other out. Even if there was a net bias, both γ and the effect of C_{isy} on age at marriage are small and easily swamped by a large unbiased value of α. Finally, variables measured at the state-year level may simply not pick up much of the important variation in the factors influencing age at marriage and divorce. Even when one looks within state-year pairs, controlling for all factors varying at this level, α does not substantially change (see Table 2, col.

[27] Appendix A.4 contains details on these variables and their measurement.

[28] The average yearly hazard rate of divorce is 2.0 percent at $t = 10$, 1.4 percent at $t = 20$, and 0.6 percent at $t = 30$.

[29] When individually included in the regression, most of the C_{isy} variables do not have coefficients significantly different from zero; however, all significant γ coefficients are consistent with the model presented in Section 4. Further, when individually added to the regression, none of the variables meaningfully changes α.

4).

These estimates suggest that the omission of observable variables does not lead to much bias in estimating the effect of age at marriage on divorce. But there may be important unobservable variables. I thus also use the method proposed by Altonji, Elder, and Taber (2005) to determine how large the bias from omitting unobservables would have to be to explain the estimated coefficient on age at marriage.

I simplify the problem of omitted variable bias by focusing on individual estimates of the coefficients associated with indicators for marrying before a certain age (18, 22, or 28) in regressions predicting divorce before certain points in a couple's marriage (the fifth, tenth, 15th, or 20th anniversary). I then estimate the effect of age using the 1968-2004 SIPP sample and including either no other covariates or the full vector of observable controls in the regression (see Table 3). The coefficients vary somewhat with the inclusion of controls, giving one a sense that selection on observables, particularly year of marriage and bride's education, may be important to some extent. Given these estimates, one can then assume that the true effect of age at marriage on divorce is zero ($\alpha = 0$) and back out the implied extent of selection on unobservables (relative to observables).

Unobservables would have to strongly influence age at marriage for selection to explain the entire estimated value of α (see Table 3). To conclude that age has no causal effect on ten-year divorce rates, selection on unobservable characteristics would have to be about five times as strong as selection on observable characteristics. If one allows early marriage to have an effect on divorce, but imposes that there is no difference in divorce rates between those marrying before and after age 28, selection on unobservables would have to be more than 1.7 times as important as selection on observables. Because the observed variables I use include important determinants of both age at marriage and divorce (and indicators for year of marriage and state of birth), these levels of relative selection are unlikely. This suggests that age at marriage, and not some other combination of observable or unobservable factors, is the main proximate cause of the decline in divorce from 1980 to 2004.

3.3 Controlling for Family Background

Family and personal background could also affect both age at marriage and marital stability.[30] For example, many religions advocate either early marriage, limited divorce, or both. Young women who grew up in intact families may view marriage and divorce differently from those who experienced their parents' separation. I therefore use the 1979 National Longitudinal Survey of Youth (NLSY) to control for factors such as religion and childhood family structure.[31] The survey tracks a single cohort of women (age 14 to 22 in 1979), who on average married in 1984 at age 23.

The most straightforward approach to using the data adds controls for family background to the hazard regression, as in

$$\log h_i(t) = \log h(t) + \beta X_i + \alpha Age_i + \gamma F_i + \varepsilon_{it} \tag{2}$$

where F_i is a vector of background variables (controls for religion, religious participation, family structure, media access, and mother's and father's labor force participation, education, and occupation). The NLSY also includes a sample of almost 900 sisters that I use to estimate regressions with family fixed-effects, as in

$$\log h_{if}(t) = \log h_f(t) + \beta X_i + \alpha Age_i + \varepsilon_i. \tag{3}$$

Ideally, the inclusion of family effects or family background variables allows one to estimate the effect of age at marriage on divorce, holding some of the determinants of the gains to marriage constant. However, adding fixed-effects to eq. (3) may increase the bias in α.

[30] See Gruber (2004) and Trent and South (1989).

[31] These variables are omitted from the SIPP. See Appendix A.2 for details on the NLSY.

In particular, fixed-effects will only lessen the bias if the fraction of variability in divorce that the family explains exceeds the fraction of variability in age at marriage that the family explains.[32]

Similar to the results found when adding controls at the state-year level, including controls for factors other than education does not change the coefficient on age at marriage in a meaningful way, as demonstrated by the estimates in Table 4. In addition, including family effects does little to change the value of α (see Table 5). Specifications that replace the linear age at marriage term in eqs. (2) and (3) with a set of dummy variables also produce qualitatively similar results. Overall, the estimates from the NLSY further suggest that increases in age at marriage, and not changes in family structure, religion, or other background variables, explain most of the drop in divorce rates from 1980 to 2004.

3.4 IV Using State Age Restrictions on Marriage

These initial analyses allow one to understand potential threats to a causal interpretation of the relationship between age at marriage and divorce, but they do not provide point estimates of the causal impact of age at marriage. To do this, I use an IV procedure that exploits variation in marriage age caused by laws limiting the earliest age that a woman can marry, with and without parental consent.[33] Because the regressions use instruments defined at the birth cohort level, the analysis is conducted on a sample consisting of ever-married women in the SIPP born from 1920 to 1974, regardless of year of marriage.

In total, 39 (22) states changed the minimum age at marriage with (without) parental permission, on average 2.00 (1.95) times. These changes then identify systems of equations

[32]Griliches (1979) shows that this is a necessary and sufficient condition for the addition of fixed-effects to reduce bias if there is no measurement error. Stronger assumptions may be needed if age at marriage is measured with error.

One cannot test this assumption but the inherent randomness of the marriage market makes it more likely to hold.

[33]Each girl is matched to a vector of indicators for the laws prevailing in her birth state when she is age 16.

Dahl (2010) previously used this instrument to determine the relationship between early marriage and welfare receipt. See Appendix A.5 for details on these laws.

such as

$$Y_{it} = \beta_t X_i + \theta_{its} + \delta_{itc} + \alpha_t(Age_i < 18) + \varepsilon_{ist} \quad (4)$$

$$(Age_i < 18) = \widetilde{\beta} X_i + \widetilde{\theta}_{its} + \widetilde{\delta}_{itc} + \varphi A_{isc} + e_{ist} \quad (5)$$

where Y_{it} is a variable indicating if a couple divorces within t years of marriage, X and θ are defined as before, δ is a vector of birth cohort fixed-effects, $(Age_i < 18)$ is an indicator for a girl marrying prior to her 18th birthday, and A_{isc} is a vector of indicators for the legal status of marriage (with and without parental consent) for girls of different ages.

Minimum age at marriage laws force many teenagers to wait to marry even if they have found a desirable spouse. The laws, however, are not binding for all teens seeking to wed. Many young women go across state lines or misrepresent their age to obtain an illegal marriage license.[34] Moreover, an analysis of legal records indicates that an underage girl could sometimes receive judicial permission to marry if she could present good reason (e.g., her pregnancy) to the court. My IV estimates of α are therefore LATEs specific to teens who do not circumvent these laws but would otherwise choose to marry.[35] Note, however, that changes in the proportion of brides under age 18 can explain about one-fifth of the fall in divorce from 1980 to 2003 (see Table 1). Understanding the effects of marriage on young teens who can be persuaded to wait to marry is therefore important for explaining divorce trends.

By discouraging early marriage, these laws could also discourage women from ever getting married. The pool of married women, and thus divorce rates, could change. However, I find no evidence that more restrictive age at marriage laws during a woman's teenage years decreased the probability that she appears in my sample of marriages. Further, more restrictive minimum age at marriage laws are not associated with higher rates of likely cohab-

[34] See Blank, Charles, and Sallee (2009).

[35] This LATE could also reflect the effect of a culture that encourages such early marriages, or a combination of such culture and the act of marrying at a young age.

itation in the Current Population Survey (both overall and for women under 25), suggesting these laws do not encourage non-marital unions.[36] Changes in the laws are also not preceded by trends in teenage marriage, young divorce, or single motherhood.[37]

The legal variables are relevant instruments, as demonstrated in Table 6 by the the first-stage of the IV procedure. Logically, states with more permissive laws have higher rates of early teenage marriage. Together, the variables have a joint F-statistic near 12 and a probit specification demonstrates that the strength of the instruments does not rely on the specific functional form chosen. Thus, weakness of these instruments is likely not a problem.[38]

I use Maximum Likelihood to calculate the marginal effect of early teenage marriage from eq. (4), assuming e and ε are jointly normal. The coefficients from the IV regressions are generally larger than the standard estimates, as depicted in Figure 6. But the two coefficient vectors are statistically indistinguishable. Non-IV probit regressions imply that marriage before age 18 is associated with a 12 percentage point or 50 percent increase in the probability of divorce before one's tenth anniversary (a 10 percentage point or 25 percent increase in the probability of divorce before the 20th anniversary). At the tenth anniversary, the IV and non-IV estimates are nearly identical; at the 20th anniversary, the IV estimates are about 50 percent larger than those produced by a standard probit model. The IV estimates significantly differ from zero at most anniversaries, despite their large standard errors. Additionally, these results are robust to analyzing only more recent cohorts of women, using only laws for age at marriage with parental permission as instruments, using minimum age at marriage laws for both men and women as instruments, or considering the effect of laws on subsets of women who marry before they are 20, 22, or 25 years old.[39]

[36] See Appendix A.4 for details on the measure of likely cohabitation.

One might also worry that limits on teenage marriage decreased age at marriage for those with ages just above a cutoff, violating the monotonicity assumption of instrumental variables. However, there is no evidence that raising the minimum age at marriage leads women above the new minimum to wed earlier.

[37] See Appendix A.5 and Figure A2.

[38] Estimates using limited information maximum likelihood, which Stock and Yogo (2002) show to be more robust to weak instruments, confirm my results.

[39] However, the estimates are somewhat sensitive to the specific form of the regressions used to calculate

The LATEs estimated using minimum age at marriage laws as instruments are relatively well-defined but somewhat limited due to an inability to extrapolate the results to non-compliers. The lack of generalizability makes it difficult to determine to what precise extent this analysis alone suggests that increases in age at marriage can explain the fall in divorce. It does, however, suggest that age at marriage can be a very important predictor of divorce, affects some group of women, and has the potential to explain at least a portion of the fall in the divorce rate for couples marrying between 1980 and 2004.

Moreover, similarity between the plausibly causal estimates produced using IV and the estimates calculated using state-year fixed-effects (see Table 3A) suggests that estimates using the latter method are not highly biased measures of the effect of age at marriage on divorce.[40] Together, my three analyses indicate that an increase in age at marriage is a major proximate cause of the decrease in divorce rates from 1980 to 2004. Comparing the uncorrected and corrected coefficients on age at marriage further suggests that increases in age at marriage account for at least 60 percent, and potentially more, of the decline in divorce.

4 Accounting for Both the Rise and Fall of Divorce Rates

Past work on the family suggests that various factors relating to decreases in the gains to marriage (e.g., increased access to birth control or a women's growing role in the labor market) led to increases in age at marriage.[41] The empirical evidence presented in the previous

the effects in (6). One could instead model both stages of the regression as linear or use a linear first-stage and a hazard function for the second stage. Many combinations may be of interest. The specification shown has the most conservative point estimates of all attempted combinations, suggesting the true effect of age at marriage on divorce may be larger. All other specifications yielded less precise point estimates, though effects were often statistically different from zero.

[40]My IV estimates capture LATEs for a specific group of women. The women who are affected by minimum age at marriage laws likely marry earlier than average. Additionally, the first stage of the IV procedure is stronger when one considers less-educated women. Estimating eq. (4) using the subset of women who marry before age 22 and do not have a college degree yields coefficients on age at marriage closer to the IV estimates reported in Figure 6, further supporting the limited bias of the estimates produced in Section 3.1.

[41]For example, see Becker (1973, 1974, 1991) on female labor force participation and Goldin and Katz (2002) on the pill.

sections further indicates that these increases in age drove down divorce rates. Within the literature, my results therefore imply that decreases in the gains to marriage led to lower rates of divorce, via increases in age at marriage. However, this hypothesis is potentially at odds with trends earlier in the century. Most of the variables associated with the gains to marriage evolved monotonically from 1960 to 2004. But the earlier part of this period is characterized by increasing divorce rates. Similar changes in the gains to marriage thus appear to imply very different changes in the divorce rate before and after 1980.

In an Online Appendix, I rationalize this fact using a search model of the marriage market. The key distinguishing prediction of this model is that changes in the gains to marriage asymmetrically impact current and future marital stability. A decrease in the relative value of marriage leads to a higher divorce rate among women married at the time of a change. But the same change induces single women to be pickier about whom they marry and to wait longer to marry. These effects imply that a decrease in the value of marriage first leads to higher divorce rates but eventually causes marriages to become more stable. The asymmetry allows this relatively simple model to predict that monotone changes in the gains to marriage can produce a rise in age at marriage and an inverted U-shaped trend in divorce rates.

In essence, this result captures the fact that marriages formed under one regime will not necessarily persist under another (c.f., Isen and Stevenson 2010, Stevenson and Wolfers 2007). The matches made in the 1950s, 1960s, and 1970s were optimal given the conditions then; however, such marriages dissolved as society changed, raising the divorce rate.[42] Marriages formed under the new regime were stronger, partly because of the rise in age at marriage. That is, underlying changes in marriage led existing marriages to dissolve while making future marriages stronger. Thus, a monotone increase in age at marriage can be consistent with an initial rise and subsequent fall in divorce rates.

[42] Note that although marital instability started to rise with marriages beginning in the last 1950s, Figure 1 demonstrates that the number of divorces per marriage did not begin to rapidly increase until the late 1960s, when age at marriage also began to change.

5 Conclusion

During the past several decades, women moved into the labor force, experienced wage gains, and gained greater control over their fertility. As these changes occurred, divorce rates first rapidly rose but then began to fall. Although much is known about the initial rise in divorce, little had been previously said about its subsequent strong and sustained decline.

This paper demonstrates that once one controls for bride's age, couples marrying from 1980 to 2004 face similar average risks of divorce. To determine if age at marriage is the proximate cause of the decline in divorce, I use three different techniques that mitigate bias in estimates of the effect of bride's age on marital stability. Controlling for the major causes of family change (e.g., female labor force participation, access to birth control, and divorce laws), controlling for family background (including family fixed-effects), and instrumenting for early teenage marriage using state laws governing the minimum age at marriage, I provide evidence suggesting that the true, causal relationship between a woman's age at marriage and her future probability of divorce cannot be substantially weaker than suggested by uncorrected estimates. All of the estimates suggest that the hazard of divorce falls by at least 6 percent when a bride waits one additional year to marry, implying that age at marriage can explain at least 60 percent of the fall in the divorce rate for cohorts marrying from 1980 to 2004.

Within the literature on the family, these results indicate that decreases in the relative value of marriage caused an increase in age at marriage, which in turn caused the divorce rate to decrease from 1980 to 2004. Although the underlying, distal cause of the drop in divorce is likely multifaceted, I demonstrate that the rise in age at marriage is the main proximate cause of divorce's decline.

A Data Appendix

A.1 Survey of Income and Program Participation

The bulk of my analysis utilizes the Survey of Income and Program Participation (SIPP) panels beginning in 2001, 2004, and 2008. These datasets provide retrospective information about a respondent's first marriage, including the year of marriage and the date and way a marriage ended, if applicable.[43] I focus my analysis on the 74,339 women in these SIPP waves with complete marital records who began their first marriages between 1950 and 2004.[44] I can also match 62,572 of these women to their state of birth, which I use to incorporate additional data.

A.2 National Longitudinal Survey of Youth (1979)

Because of many omitted variables in the SIPP, I also utilize the 1979 National Longitudinal Survey of Youth (NLSY), which follows young men and women as they marry and divorce.[45] The NLSY is much smaller than the SIPP (containing 3,831 women with adequate data) and may not be used to study trends over time, as the dataset includes a single cohort of individuals (age 14 to 22 in 1979).[46] On average, women in the sample marry at age 23 in 1984. This is slightly younger than the average age at marriage reported by the same cohort in the SIPP. The difference is likely due to attrition from the NLSY over time.

This data includes valuable family background variables, such as religion and the presence of a father figure within the home, making it relevant to my study. 2,827 women in this

[43] All of my analysis treats length of marriage as a censored variable if a given marriage has not ended due to divorce.

[44] Average age of marriage jumps in 2004, although such a change may be the result of differences in coding across SIPP panels or noise. Except when looking directly at trends in age at marriage, I will include 2004 in my analysis. In addition, all results are robust to the inclusion or exclusion of this year.

[45] Marriages occurring before a young adult enters the panel are also retrospectively recorded.

[46] Other NLS cohorts exist but cannot be used due to limited variation in age at marriage (the 1968 young women's cohort) or an insufficient time horizon (the 1997 cohort).

sample also report detailed parental characteristics (mother's and father's LFP, standardized Duncan SEI score, and years of education).[47] Finally, the NLSY contains 894 sisters (from 422 families), whom I use to estimate within-family regressions.

A.3 National Survey of Family Growth

Additional information on marriages and relationships comes from the National Survey of Family Growth (NSFG), which has surveyed ever-married women every few years since 1973. The NSFG contains a large sample of women ages 15 to 44 and rich data on fertility; some waves also contain information about a woman's first spouse. All variables in these datasets are reported by these women and thus male characteristics are reported by a man's wife or ex-wife. I select all women from the NSFG with complete marital histories for first marriages beginning from 1950 to 2004, producing a sample of 34,124 women surveyed in 1973, 1976, 1982, 1988, 1995, 2002, or 2006-2008.

I also consider women surveyed in 1988, 1995, 2002, or 2006-2008 who have ever married or cohabited to construct alternative union histories, considering any coresidential union instead of only formal marriages. This yields a sample of 15,882 unions. I classify a non-marital union as dissolved if a woman reports she stopped living at the same address as her partner. Cohabitations which transition to marriage are considered a single union with length equal to the length of cohabitation plus the length of marriage

A.4 State-Level Data

This section more carefully describes the state-year variables that I use in the analysis of Section 3.1.[48] All variables are measured using the average value for the five years prior to a

[47] I assign a Duncan score to those who do not work, as detailed in Dworkin (1981).

[48] Both Stevenson and Wolfers (2007) and Greenwood and Guner (2008) also discuss the possibility that household technological progress influenced trends in marriage and divorce. Although these factors are likely important, one cannot measure them at the state-year level and thus I must omit them from my analysis.

woman's marriage and matched to individuals using state of birth and year of marriage.[49]

1. Abortion Access: the number of abortions per woman age 15-44. Numbers for 1970-1972 come from the Center for Disease Control (1971, 1972, 1974) and those for subsequent years are from the Guttmacher Institute (Jones and Kooistra 2011). I use information on abortion by state of occurrence to create the longest sample possible and assume a rate of zero prior to 1970 (when abortion was first legalized on demand in five states).

2. Cohabitation: I use the March Current Population Survey (CPS) for 1963-2004 to identify those households involving "likely cohabitation" using Manning's (1995) definition: two unmarried, unrelated, opposite-sex adults over age 15 living together with no other people above age 15. Manning shows that this definition gives aggregate estimates of cohabitation close to actual rates.

3. Comstock Laws: an indicator for a state sales ban on contraceptives, using Bailey's (2010) classification.

4. Reproductive Technology: an indicator for an unmarried 18-year-old being able to purchase the oral contraceptive pill, from Goldin and Katz (2002).

5. Unilateral Divorce Law: Wolfers's (2006) preferred classification of state unilateral divorce laws and reforms.

6. Welfare Benefits: The measures available for welfare vary over time. Benefit levels for early years are from the Statistical Abstracts of the United States (1941-1995). For 1940-1944 and 1946-1952, I use total benefits paid out/total families receiving benefits in June; the numbers for 1945 are from December. Benefits for 1951 and 1952 include

[49]Other choices for the form of C_{isy} yield similar results. Sophisticated methods of lag selection are computationally infeasible due to the large number of possible combinations of my 14 variables of interest.

reimbursement for medical services. For 1953-1965, the data sources provide average payments per family in December including medical benefits and such numbers without medical benefits during 1966-1973. For 1974-1995, average monthly benefits per family are taken over all months, excluding Medicaid payments. Starting in 1995, intermittent reports from the Administration for Children and Families (1995, 1997, 1999, 2001-2004) became available, allowing one to calculate the average monthly benefit. I log-linearly interpolate the missing years. Finally, the IPUMS Censuses provide estimates of the proportion of unmarried mothers who have one, two, three, or four or more children, at the state-by-year level. I create my final measure of log welfare benefits using the errors from a regression of the log benefit level on these proportions and year fixed-effects.

Many of the variables come from samples of workers in the 1964-2005 CPS. I drop anyone living in group quarters or with incomplete demographic information (on education, marital status, and state of residence). The sample includes only those age 18-35, as my analysis largely deals with people earlier in life.

7. Female Labor Force Participation: the proportion of married women working any hours for some number of weeks last year and the proportion of women who worked 30 or more hours in the past week and 50 or more weeks in the past year (full-time, full-year).[50]

8. Segregation by Gender at Work: I first use CPS data on those working any hours to compute the segregation index by occupation-industry cells. Both occupations and industries are classified into 16 groups (available upon request). I then calculate the

[50]These are the only continuously available measures of work hours and weeks in the CPS from 1963-2005.

segregation index for a given state at a given time as

$$Seg_i = \frac{1}{2}\sum_{i,o}\left|\frac{N_{iof}}{N_f} - \frac{N_{iom}}{N_m}\right|$$

where i indexes industry, o indexes occupation, N_f (N_m) is the total number of working females (males) in the state at a given time, and N_{iof} (N_{iom}) is the number of females (males) primarily working in industry i and occupation o. I also create variables indicating the proportion of women working in traditionally male and traditionally female jobs, where traditionally male (female) jobs are defined as containing more than 95 percent male (75 percent female) workers in the 1950 Census.

Additionally, I use wage data from the CPS to control for both male wage inequality and the gender gap in wages. Using the sample of full-time, full-year workers from the CPS, I drop any workers in the armed forces, agricultural sector, or private household sector from the sample. I also omit any observations with allocated or missing wage and salary income and multiply any top-coded income variables by 1.5. The hourly wage is calculated by taking yearly wage income and dividing it by 50 times the number of hours worked last week. Any observations with nominal hourly wages below the minimum wage or a wage rate that would be top-coded if a person worked 30 hours per week for 52 weeks of the year are also removed from the sample.

9. Gender Gap in Wages: the difference in the log median wages of men and women, calculated using the above sample.

10. Wage Inequality: the difference in the 90th and 50th, as well as 50th and 10th, percentiles of the log wage distribution in the above sample.

A.5 State Age at Marriage Laws

The vast majority of data on minimum age at marriage laws comes from the 1933-2001 editions of the *World Almanac and Book of Facts*. The almanac stopped reporting these laws in 2001, and thus I use the database of the Cornell Legal Information Institute for the 2001-2004 laws. When the two sources for these laws do not match, information from state legislative archives resolves the conflict. If a law allows for marriage before the age of majority, but no age limit is specified, I set the age of marriage with consent to 12, the common law minimum age for girls.[51]

Many states changed their laws throughout time but some changes reported in the Almanac may be erroneous.[52] If a law changes for one or two periods only, then switches back, I remove the change. If a law changes for one period and then changes again, and the changes do not move in the same direction, the first change is set to the original value. Massachusetts and Montana are omitted from the analysis, as there are many changes in the recorded laws that may or may not coincide with actual legislation. Figure A1 shows the evolution of minimum age at marriage laws over time for women, with (Panel A) and without (Panel B) parental permission. The figures show a clear increase in the allowed age at marriage with parental consent but a decrease in the age without such consent.

To determine whether law changes were driven by rates of young marriage, childbearing, or divorce, I also looked at trends in these variables leading up to (first) changes in laws (shown in Figure A2). Although much variation in these variables exists prior to a law change, one sees no clear trend in teenage marriage; the proportion of children under 11 living with young, unmarried mothers; or divorce among those under 25 before an increase or decrease in the minimum age, making these laws plausible instruments.

[51] The age at marriage without parental consent was recorded by the Almanac to be the age of majority if no law provided for early marriage.

[52] See Dahl (2010). Although Dahl's work uses laws for a somewhat different period (1935-1969 versus 1936-1990 in my main analysis), I use the same data sources and process the raw data in a similar manner.

References

Administration for Families and Children, Office of Family Assistance. 1995, 1997, 1999, 2001-2004. *Characteristics and Financial Circumstances of TANF Recipients.*

Akerlof, George A., Janet L. Yellen and Michael L. Katz. 1996. "An Analysis of out-of-Wedlock Childbearing in the United States." *Quarterly Journal of Economics*, 111(2), pp. 277-317.

Altonji, Joseph G., Todd E. Elder and Christopher R. Taber. 2005. "Selection on Observed and Unobserved Variables: Assessing the Effectiveness of Catholic Schools." *Journal of Political Economy,* 113(1), pp. 151-84.

Angrist, Josh. 2002. "How Do Sex Ratios Affect Marriage and Labor Markets? Evidence from America's Second Generation." *Quarterly Journal of Economics,* 117(3), pp. 997-1038.

Bailey, Martha J. 2010. "'Momma's Got the Pill': How Anthony Comstock and Griswold V. Connecticut Shaped US Childbearing." *American Economic Review*, 100(1), pp. 98-129.

Becker, Gary S. 1973. "A Theory of Marriage: Part I." *Journal of Political Economy*, 81(4), pp. 813-46.

____. 1974. "A Theory of Marriage: Part II." *Journal of Political Economy,* 82(2), pp. S11-S26.

____. 1991. *A Treatise on the Family: Expanded Edition.* Cambridge, MA: Harvard University Press.

Becker, Gary S., Elisabeth M. Landes and Robert T. Michael. 1977. "An Economic Analysis of Marital Instability." *Journal of Political Economy,* 85(6), pp. 1141-87.

Bitler, Marianne P., Jonah B. Gelbach, Hilary W. Hoynes and Madeline Zavodny. 2004. "The Impact of Welfare Reform on Marriage and Divorce." *Demography*, 41(2), pp. 213-36.

Blank, Rebecca M., Kerwin Kofi Charles and James M. Sallee. 2009. "A Cautionary Tale About the Use of Administrative Data: Evidence from Age of Marriage Laws." *American Economic Journal: Applied Economics*, 1(2), pp. 128-49.

Brien, Michael J., Lee A. Lillard and Steven Stern. 2006. "Cohabitation, Marriage, and Divorce in a Model of Match Quality." *International Economic Review*, 47(2), pp. 451-94.

Carter, Susan B., Scott Sigmund Gartner, Michael R. Haines, Alan L. Olmstead, Richard Sutch, and Gavin Wright (eds.). 2006. *Historical Statistics of the United States, Earliest Times to the Present: Millennial Addition.* New York, NY: Cambridge University Press

Centers for Disease Control. 1971. *Abortion Surveillance Report – Legal Abortions, United States, Annual Summary, 1970.* Atlanta, GA: Center for Disease Control.

Centers for Disease Control. 1972. *Abortion Surveillance Report – Legal Abortions, United States, Annual Summary, 1971.* Atlanta, GA: Center for Disease Control.

Centers for Disease Control. 1974. *Abortion Surveillance, Annual Summary, 1972.* Atlanta, GA: Center for Disease Control.

Cherlin, Andrew J. 2004. "The Deinstitutionalization of American Marriage." *Journal of Marriage and Family*, 66(4), pp.848-61.

Dahl, Gordon B. 2010. "Early Teen Marriage and Future Poverty." *Demography*, 47(3), pp. 689-718.

Dinardo, John, Nicole M. Fortin and Thomas Lemieux. 1996. "Labor Market Institutions and the Distribution of Wages, 1973-1992: A Semiparametric Approach." *Econometrica*, 64(5), pp. 1001-44.

Dworkin, Rosalind J. 1981. "Prestige Ranking of the Housewife Occupation." *Sex Roles*, 7(1), pp. 59-63.

Ellwood, David T. and Mary Jo Bane. 1985. "The Impact of AFDC on Family Structure and Living Arrangements," In Ehrenberg, Ron G., ed., *Research in Labor Economics*, vol. 7, ed. R.G. Ehrenberg. Greenwich, CT: JAI Press.

Friedberg, Leora. 1998. "Did Unilateral Divorce Raise Divorce Rates? Evidence from Panel Data." *American Economic Review,* 88(3), pp. 608-27.

Goldin, Claudia and Lawrence Katz. 2002. "The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions." *Journal of Political Economy*, 110(4), pp. 730-70.

Goldstein, Joshua R. 1999. "The Leveling of Divorce in the United States." *Demography*, 36(3), pp. 409-14.

Gould, Eric D. and M. Daniele Passerman. 2003. "Waiting for Mr. Right: Rising Inequality and Declining Marriage Rates." *Journal of Urban Economics*, 53(2), pp. 257-81.

Greenwood, Jeremy and Nezih Guner. 2008. "Marriage and Divorce since World War Ii: Analyzing the Role of Technological Progress on the Formation of Households." In *NBER Macroeconomics Annual 2008*, eds. D. Acemoglu, K. Rogoff and M. Woodford. Chicago, IL: University of Chicago Press.

Greenwood, Jeremy, Ananth Seshardi and Mehmet Yorukoglu. 2005. "Engines of Liberation." *Review of Economic Studies,* 72(1), 109-33.

Griliches, Zvi. 1979. "Sibling Models and Data in Economics: Beginnings of a Survey." *Journal of Political Economy,* 87(5), pp. S37-S64.

Grossbard-Shechtman, Shoshana. 1993. *On the Economics of Marriage: A Theory of Marriage, Labor, and Divorce.* Boulder, CO: Westview Press.

Guttentag, Marcia and Paul F. Secord. 1983. *Too Many Women? The Sex Ratio Question.* Beverly Hills, CA: Sage Publications.

Gruber, Jonathan. 2004. "Is Making Divorce Easier Bad for Children? The Long-Run Implications of Unilateral Divorce." *Journal of Labor Economics*, 22(4), pp. 799-833.

Hoynes, Hilary W. 1996. "Work, Welfare, and Family Structure: What Have We Learned?," *NBER Working Paper No. 5644.*

Isen, Adam and Betsey Stevenson. 2010. "Women's Education and Family Behavior:

Trends in Marriage, Divorce and Fertility," *NBER Working Paper No. 15725.*

Johnson, William R. and Jonathan Skinner. 1986. "Labor Supply and Marital Separation." *American Economic Review,*76(3), pp. 455-69.

Jones, Rachel K. and Katheryn Kooistra. 2011. "Abortion Incidence and Access to Services in the United States, 2008." *Perspectives on Sexual and Reproductive Health*, 43(1), pp. 41-50.

Kreider, Rose M. and Renee Ellis. 2011. "Number, Timing, and Duration of Marriages and Divorces: 2009." *Current Population Reports*, May(2011), pp. 1-23.

Lehrer, Evelyn L. 2008. "Age at Marriage and Marital Instability: Revisiting the Becker–Landes–Michael Hypothesis." *Journal of Population Economics*, 21(2), pp. 463-84.

Lehrer, Evelyn L. and Yu Chen. 2011. "Women's Age at First Marriage and Marital Instability: Evidence from the 2006-2008 National Survey of Family Growth." *IZA Discussion Paper No. 5954.*

____. 2012. "Delayed Entry into First Marriage: Further Evidence on the Becker-Landes-Michael Hypothesis." *IZA Discussion Paper No. 6729.*

Loughran, David S. 2002. "The Effect of Male Wage Inequality on Female Age at First Marriage." *Review of Economics and Statistics*, 84(2), pp. 237-50.

Manning, Wendy D. 1995. "Comparisons of Direct and Inferred Measures of Cohabitation," Population Research Institute, *mimeo.*

Manski, Charles F., Gary D. Sandefur, Sara McLanahan, and Daniel Powers. 1992. "Alternative Estimates of the Effect of Family Structure during Adolescence on High School Graduation." *Journal of the American Statistical Association,* 87(417), pp. 25-37.

McKinnish, Terra G. 2007. "Sexually Integrated Workplaces and Divorce: Another Form of on-the-Job Search." *Journal of Human Resources*, 42(2), pp. 331-52.

Mechoulan, Stéphane. 2006. "Divorce Laws and the Structure of the American Family." *Journal of Legal Studies*, 35(1), pp. 143-74.

Moffitt, Robert. 1997. "The Effect of Welfare on Marriage and Fertility: What Do We Know and What Do We Need to Know?" University of Wisconsin Institute for Research on Poverty, *Institute for Research on Poverty Discussion Papers*.

Neeman, Zvika, Andrew F. Newman and Claudia Olivetti. 2008. "Are Career Women Good for Marriage?" Boston University, *Institute for Economic Development Working Paper Series DP-167.*

Oppenheimer, Valerie Kincade. 1997. "Women's Employment and the Gain to Marriage: The Specialization and Trading Model." *Annual Review of Sociology*, 23, pp.431-53.

Parkman, Allen. 1992. "Unilateral Divorce and the Labor-Force Participation Rate of Married Women, Revisited." *American Economic Review*, 82(3), pp. 671-78.

Peters, H. Elizabeth. 1986. "Marriage and Divorce: Informational Constraints and Private Contracting." *American Economic Review*, 76(3), pp. 437-54.

Rasul, Imran. 2006. Marriage Markets and Divorce Laws." *Journal of Law, Economics, and Organization*, 22(1), pp. 30-69.

Ruggles, Steven. 1997. "The Rise of Divorce and Separation in the United States, 1880–1990." *Demography*, 34(4), pp. 455-66.

Stevenson, Betsey and Justin Wolfers. 2007. "Marriage and Divorce: Changes and their Driving Forces." *Journal of Economic Perspectives*, 21(2), pp. 27-52.

____. 2011. "Trends in Marital Stability." In *Research Handbook in the Law and Economics of the Family*, ed. L. R. Cohen and J. D. Wright. Cheltenham, United Kingdom: Edward Elgar Press.

Stock, James H. and Motohiro Yogo. 2002. "Testing for Weak Instruments in Linear IV Regression." *NBER Technical Working Paper No. 284.*

Teachman, Jay D. 2002. "Stability Across Cohorts in Divorce Risk Factors." *Demography,* 39(2), pp. 331–51.

Thornton, Arland. 1989. "Changing Attitudes toward Family Issues in the United

States." *Journal of Marriage and Family*, 51(4), pp. 873-93.

Trent, Katherine and Scott J. South. 1989. "Structural Determinants of the Divorce Rate: A Cross-societal Analysis." *Journal of Marriage and the Family,* 51(2), pp. 391-404.

United Nations, Department of Economic and Social Affairs, Population Division. 2009. *World Marriage Data 2008.*

United States Census Bureau. 1941-1996, 2007. *Statistical Abstract of the United States*, Washington, DC.

Weiss, Yoram and Robert J. Willis. 1997. "Match Quality, New Information, and Marital Dissolution." *Journal of Labor Economics*, 15(1), pp. S293-329.

Wolfers, Justin. 2006. "Did Unilateral Divorce Laws Raise Divorce Rates? A Reconciliation and New Results." *American Economic Review*, 96(5), pp. 1802-20.

World Almanac and Book of Facts. 1933-2001. New York, NY: Press Publication Company.

Table 1: Decomposing the Change in Divorce Hazards

	(1)	(2)	(3)	(4)	(5)	(6)
Independent Vars.	Coeff. (Change in Log Hazard)	Standard Error	1980 Indep. Var. Mean	2003 Indep. Var. Mean	Change from 1980 to 2003 (4)-(3)	Effect of Change on Hazard Rate (Log Points) $100*1*5$
Age at Marriage						
Under 18	0.945***	[0.0281]	0.0990	0.0272	-0.0718	-6.78
18-19	0.559***	[0.0210]	0.3061	0.1269	-0.1792	-10.02
20-22	0.255***	[0.0229]	0.1895	0.1350	-0.0545	-1.39
27-29	-0.165***	[0.0338]	0.0787	0.1414	0.0627	-1.03
30-34	-0.420***	[0.0419]	0.0496	0.1396	0.0900	-3.78
35-39	-0.622***	[0.0694]	0.0193	0.0696	0.0502	-3.13
40+	-1.21***	[0.106]	0.0169	0.0486	0.0316	-3.83
Total Change in Log Hazard Predicted by Change in Age						-29.96
Education at Marriage						
High School	0.0321	[0.0203]	0.3491	0.2222	-0.1270	-0.41
Some College	0.00946	[0.0225]	0.2803	0.3208	0.0405	0.00
College	-0.307***	[0.0308]	0.1604	0.3357	0.1753	-5.38
Black	0.0771***	[0.0228]	0.1037	0.0955	-0.0082	-0.063
Hispanic	-0.569***	[0.0346]	0.0690	0.1760	0.1071	-6.09
Other Race	-0.295***	[0.0323]	0.0682	0.0928	0.0246	-0.726
Premarital Childbearing	0.315***	[0.0206]	0.1 446	0.2862	0.1417	4.46
Urban (at Interview)	0.0749***	[0.0162]	0.7825	0.8262	0.0437	0.328
Total Change in Log Hazard Predicted by Above Non-Age Factors						-10.74
Total Change in Log Hazard Predicted by All Above Factors						-40.70
Actual Change in Log Hazard from 1980 to 2003						-36.99
Change in Log Hazard Unexplained by Observables						-3.46

Notes and sources: Women's first marriages from the 2001, 2004, and 2008 SIPP, 1950-2004 (N=74,339). See Appendix A.1 for details. Coefficients from Cox hazard regression that also includes controls for year of marriage. Coefficients measure changes in log hazard rates. Observations censored at time of interview or time of death of spouse. Omitted categories are marriage between ages 23 and 26, white, and less than high school education. Robust standard errors in brackets. *** $p<0.01$.

Table 2: Divorce Risk Controlling for the Determinants of Family Structure

Dependent Variable: Log Yearly Hazard of Divorce

Panel A: Year of Marriage: 1950-2004

	(1)	(2)	(3)	(4)
Age at Marriage	-0.0956***	-0.0845***	-0.0845***	-0.0869***
	[0.00290]	[0.00305]	[0.00306]	[0.00309]
Observations	63,035	63,035	63,035	63,035
p-value on State-Year Variables			0.0255	0.000

Panel B: Year of Marriage: 1968-2004

	(1)	(2)	(3)	(4)
Age at Marriage	-0.0937***	-0.0826***	-0.0827***	-0.0846***
	[0.00312]	[0.00325]	[0.00326]	[0.00330]
Observations	43,971	43,971	43,971	43,971
p-value on State-Year Variables			0.0421	0.000

Controls for Both Panels				
State of Birth FE	X	X	X	
Year of Marriage FE	X	X	X	
State of Birth Quadratic Trends		X	X	
Individual-Level Variables		X	X	X
State-Year Variables			X	
State-Year FE				X

Notes and sources: Women's first marriages from the 2001, 2004, and 2008 SIPP, 1950-2004. See Appendix A.1 for details. Coefficients measure changes in log hazard rates. Individual variables are for having children prior to marriage, urban location and census division (both at interview), education at marriage (four groups), and race (black, white, Hispanic, and other). State-year variables available for 1950-2004 are the abortion rate, the log average real monthly welfare benefit adjusted for family size, and indicators for unilateral divorce availability, a sales ban on contraceptives, and 18-year-old's access to birth control pills. Additional state-year variables available for 1968-2004 are the proportion of people likely cohabiting, female labor force participation (full time, full year and any hours), the log real gender gap in wages, the log real 90-50 and 50-10 wage differentials, an occupation-industry gender segregation index, the proportion of women working in traditionally male jobs and the proportion of women working in traditionally female jobs. See Appendix A.4 for details. Only the abortion rate is significant when included with no other state-year variables in regressions using marriages starting from 1950 to 2004. The proportion of women working any hours and the proportion of women working in traditionally male jobs are significant when included individually and with no other state-year variables in regressions using marriages starting from 1968 to 2004. Robust standard errors clustered by state of birth in brackets. *** $p<0.01$.

Table 3: The Relative Importance of Selection on Observables and Unobservables

Dependent Variable=1 if Marriage Ends in Divorce by Given Anniversary				
Panel A: Age Less Than 18				
Anniversary	5th	10th	15th	20th
ME of Bride's Age<18 from	0.145***	0.275***	0.242***	0.220***
Probit Regression without Controls	[0.010]	[0.018]	[0.018]	[0.019]
ME of Bride's Age<18 from	0.100***	0.195***	0.169***	0.153***
Probit Regression with Controls	[0.008]	[0.015]	[0.015]	[0.018]
Relative Selection on Unoberservables				
Required to Eliminate Effect	4.97	4.94	4.60	4.27
Brides Average Age Given 18 or Over	24.14	23.64	23.08	22.53
Brides Average Age Given Under 18	16.26	16.27	16.28	16.28
Panel B: Age Less Than 22				
Anniversary	5th	10th	15th	20th
ME of Bride's Age<22 from	0.079***	0.213***	0.208***	0.194***
Probit Regression without Controls	[0.004]	[0.006]	[0.006]	[0.008]
ME of Bride's Age<22 from	0.059***	0.188***	0.178***	0.164***
Probit Regression with Controls	[0.004]	[0.005]	[0.006]	[0.008]
Relative Selection on Unoberservables				
Required to Eliminate Effect	3.19	3.21	2.98	2.62
Brides Average Age Given 22 or Over	27.02	26.60	26.11	25.62
Brides Average Age Given Under 22	18.99	18.97	18.96	18.95
Panel C: Age Less Than 28				
Anniversary	5th	10th	15th	20th
ME of Bride's Age<28 from	0.056***	0.163***	0.202***	0.203***
Probit Regression without Controls	[0.004]	[0.008]	[0.010]	[0.012]
ME of Bride's Age<28 from	0.041***	0.137***	0.182***	0.184***
Probit Regression with Controls	[0.004]	[0.007]	[0.009]	[0.013]
Relative Selection on Unoberservables				
Required to Eliminate Effect	1.57	1.71	1.47	1.20
Brides Average Age Given 28 or Over	33.08	32.75	32.49	32.20
Brides Average Age Given Under 28	21.34	21.17	20.99	20.80
Proportion of Couples Divorced Before Ann.	0.11	0.26	0.36	0.42

Notes and sources: Women's first marriages from the 2001, 2004, and 2008 SIPP, 1968-2004. See Appendix A.1 for details. Regressions without controls include only the specified age indicator. Regressions with controls include state of birth and year of marriage fixed-effects, individual controls for having children prior to marriage, urban location and census division (both at interview), education at marriage (four groups), and race (black, white, Hispanic, and other). All of the state-year variables from Table 2 are also included. See Appendix A.4 for details. Probit regressions estimated, marginal effects reported. Observations censored at date of interview or death of spouse. Relative selection on unobservables (compared to observables) calculated using Altonji, Elder, and Taber (2005). Robust standard errors clustered by state of birth in brackets. *** $p<0.01$.

Table 4: Divorce Risk, Age at Marriage, and Family Background

	Dependent Variable: Log Yearly Hazard of Divorce					
	(1)	(2)	(3)	(4)	(5)	(6)
Age at Marriage	-0.0766***	-0.0627***	-0.0635***	-0.0633***	-0.0575***	-0.0574***
	[0.0098]	[0.0111]	[0.0113]	[0.0112]	[0.0116]	[0.0135]
Race, Education, Location		X	X	X	X	X
Children Before Marriage			X	X		X
Religion, Religiosity			X	X		X
Family Structure				X		X
Media Access Controls				X		X
Parental Characteristics						X
Complete Parent Data					X	X
Observations	3,831	3,831	3,831	3,831	2,827	2,827

Notes and sources: First marriages of women in the NLSY. See Appendix A.2 for details. Coefficients measure changes in log hazard rates. Observations censored at time of interview or time of death of spouse. Race controls include indicators for being black, white, Hispanic, or of another race; education controls for education level at marriage in four groups; location controls are for urban status and census region at marriage. Religion includes indicators for attending services once a month or more and once a week or more, and indicators for being Catholic, Protestant, or another religion. Children before marriage is an indicator for a woman having a child prior to her first marriage. Family structure includes indicators for the presence of the biological mother, biological father, both biological parents, and any father figure, as well as the number of older and younger siblings. Media access controls include indicators for the presence of newspapers, magazines, and a library card in the home. Parental characteristics are mother's and father's LFP, Duncan SEI score (standardized), and years of education. The first two variables utilize the adult in the household acting as parent at age 14, as opposed to the actual parent. Robust standard errors clustered by family in brackets. *** $p<0.01$.

Table 5: Within-Family Estimates of the Effect of Age at Marriage on Divorce Risk

Dependent Variable: Log Yearly Hazard of Divorce				
	(1)	(2)	(3)	(4)
Age at Marriage	-0.0752***	-0.0726***	-0.0810***	-0.0906***
	[0.0197]	[0.0120]	[0.0231]	[0.0255]
Race, Education, Location	X	X	X	X
Children Before Marriage	X	X	X	X
Religion, Religiosity		X	X	X
Family Structure		X	X	
Media Access Controls		X	X	
Parental Characteristics			X	
Family Effects				X
Complete Parent Data			X	
Observations	894	894	627	894
Families	422	422	297	422

Notes and sources: First marriages of women in the NLSY. See Appendix A.2 for details. Coefficients measure changes in log hazard rates. Observations censored at time of interview or time of death of spouse. Race controls include indicators for being black, white, Hispanic, or of another race; education controls for education level at marriage in four groups; location controls are for urban status and census region at marriage. Religion includes indicators for attending services once a month or more and once a week or more, and indicators for being Catholic, Protestant, or another religion. Children before marriage is an indicator for a woman having a child prior to her first marriage. Family structure includes indicators for the presence of the biological mother, biological father, both biological parents, and any father figure, as well as the number of older and younger siblings. Media access controls include indicators for the presence of newspapers, magazines, and a library card in the home. Parental characteristics are mother's and father's LFP, Duncan SEI score (standardized), and years of education. The first two variables utilize the adult in the household acting as parent at age 14, as opposed to the actual parent. Average sibling age range is 29 months. Robust standard errors clustered by family in brackets. *** $p<0.01$.

Table 6: First-Stage Estimates Using Minimum Age at Marriage Laws as Instruments

Dependent Variable=1 if Age at Marriage<18

Panel A: OLS

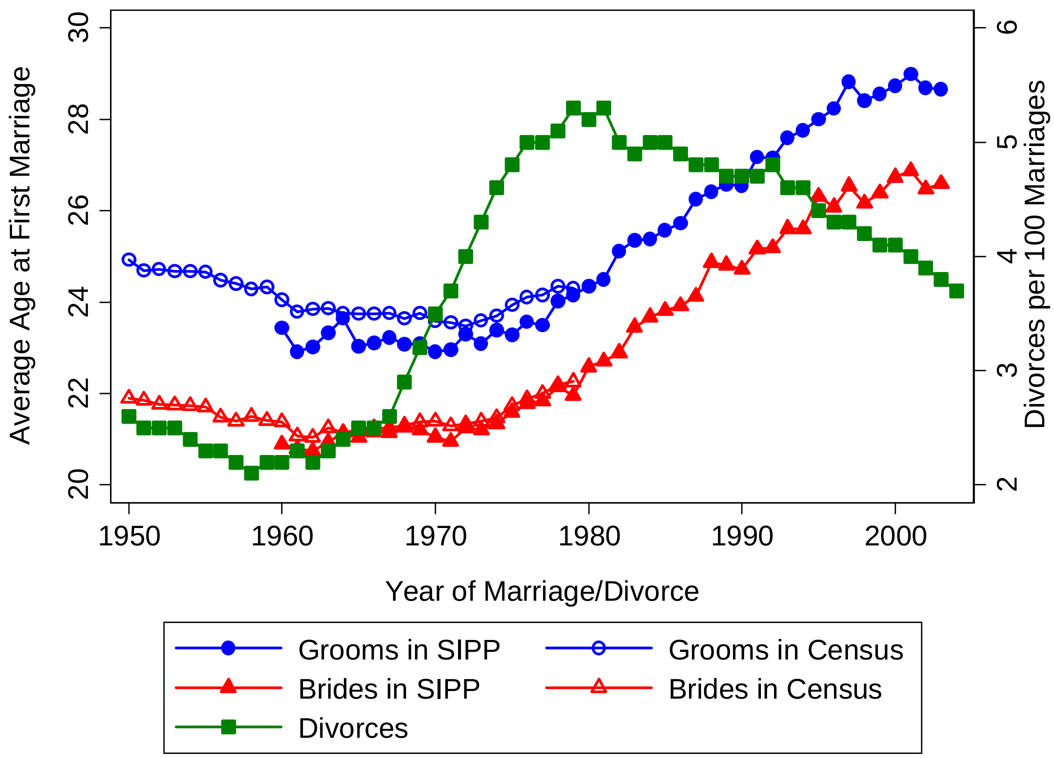
Minimum Age of Marriage with Parent's Permission			Minimum Age of Marriage without Parent's Permission		
Age	Coefficient	SE	Age	Coefficient	SE
12-13	0.0202***	[0.00580]	15	0.0574***	[0.01033]
14	0.0103	[0.00828]	16	-0.00618	[0.0193]
15	0.0274***	[0.00943]	18	0.0116***	[0.00454]
16	0.0244***	[0.00496]	19	0.0168***	[0.00714]
17	-0.00246	[0.00820]	20	-0.0189***	[0.00482]
		Observations		60,914	
		F-Statistic		11.71	
		Dependent Variable Mean		0.094	

Panel B: Probit (Marginal Effects)

Minimum Age of Marriage with Parent's Permission			Minimum Age of Marriage without Parent's Permission		
Age	Coefficient	SE	Age	Coefficient	SE
12-13	0.00805**	[0.00398]	15	-0.00558	[0.00436]
14	0.00584	[0.00407]	16	0.00551	[0.00874]
15	0.0118**	[0.00598]	18	0.00473***	[0.00174]
16	0.00810***	[0.00219]	19	0.0119***	[0.00317]
17	-0.00203	[0.00251]	20	-0.0168	[0.00777]
		Observations		60,914	
		χ^2-Statistic		107.39	
		Dependent Variable Mean		0.094	

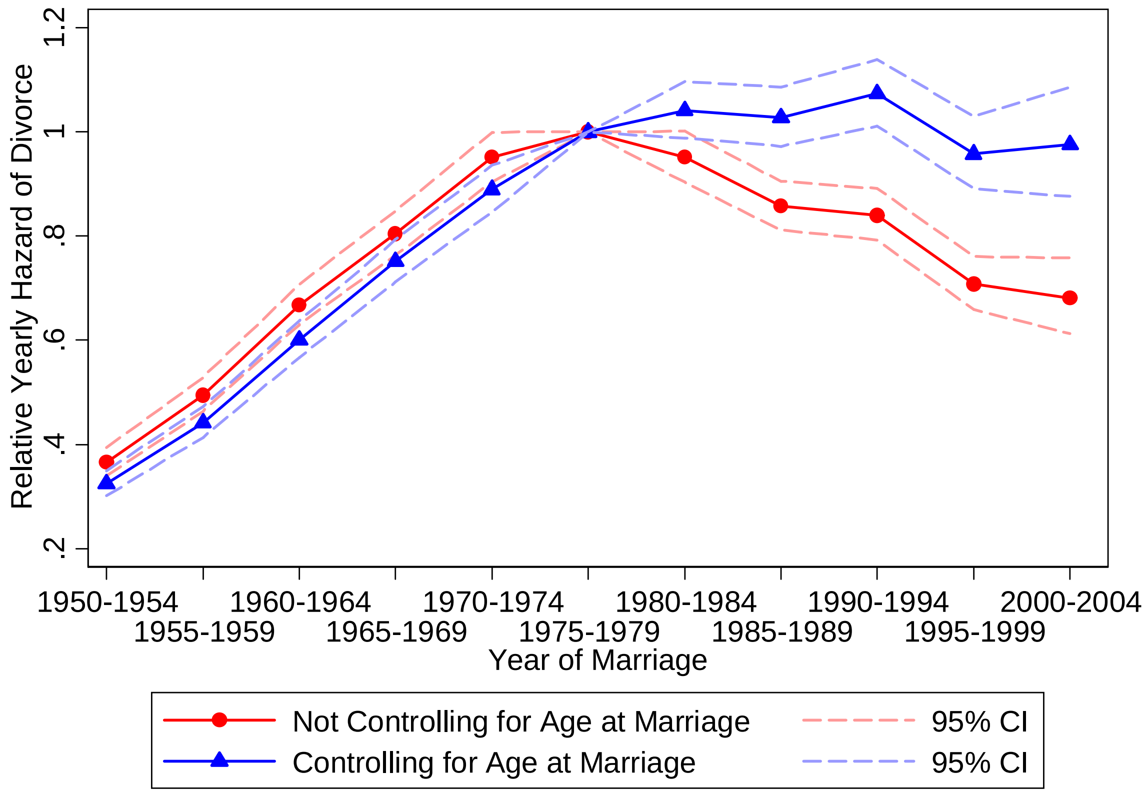
Notes and sources: Ever married women in the 2001, 2004, and 2008 SIPP, born from 1920 to 1974. See Appendix A.1 for details. Regressions also include controls for year and state of birth fixed-effects, education at marriage (four groups), having children prior to marriage, race (black, Hispanic, white, and other), census division, and urban location (both at interview). Omitted categories are 18 for age with permission and 21 for the age permission (no state in this period has 17 as the minimum age of marriage without parental consent). Laws matched to year woman is 16. See Appendix A.5 for details. Robust standard errors clustered by state of birth in brackets. *** p<0.01, **p<0.05.

Figure 1: Age at Marriage and Divorce: 1950 to 2004



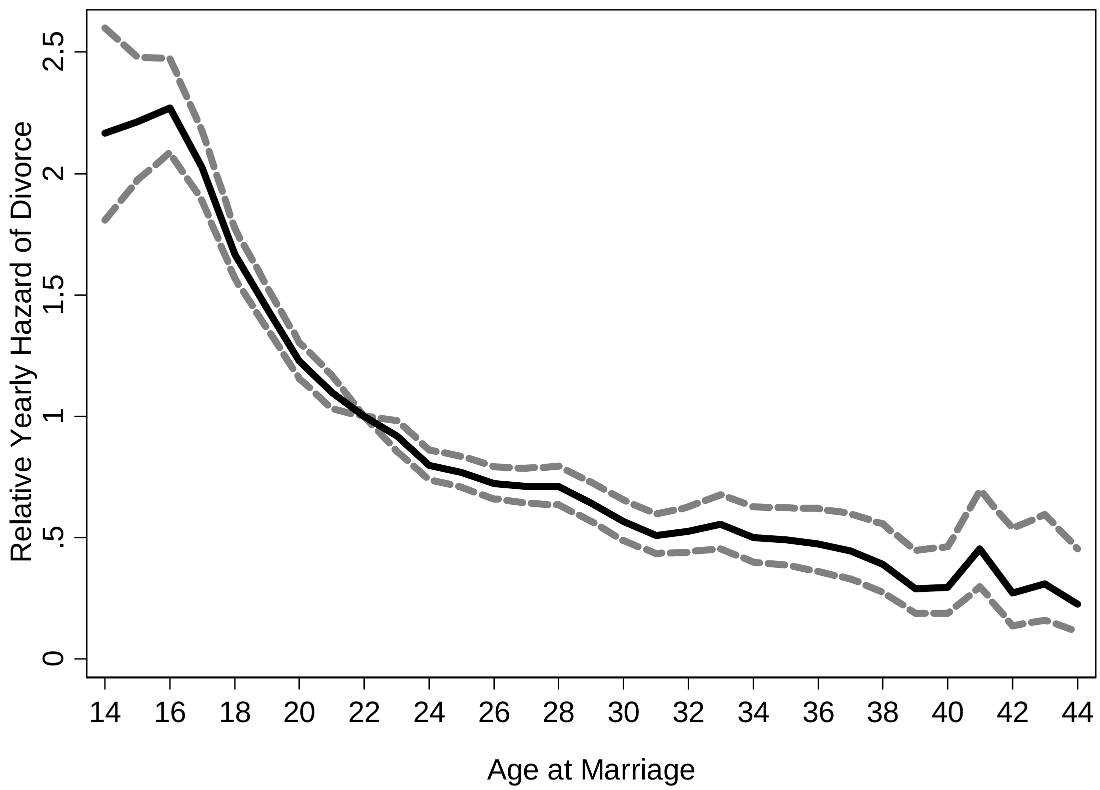
Notes and sources: Average age of first-time brides and grooms by year of marriage. SIPP sample: Women (N=62,588) and men (N=56,109) from the 2001, 2004, and 2008 SIPP panels with complete information on first marriages, 1960-2003. Census sample: Women (N=1,064,745) and men (N=1,021,497) from the largest IPUMS Census sample directly following their first marriage, 1950-1979 (i.e., age at marriage in 1975 is calculated using the reported age at first marriage for those who married in 1975 in the 1980 Census 5 Percent Sample). Difference in SIPP and Census samples likely due to selective mortality. Divorce rates: 1950-1995 from Carter, et al. (2006), 1996-2004 from U.S. Census Bureau (2007).

Figure 2: Hazard Rates of Divorce Across Marriage Cohorts



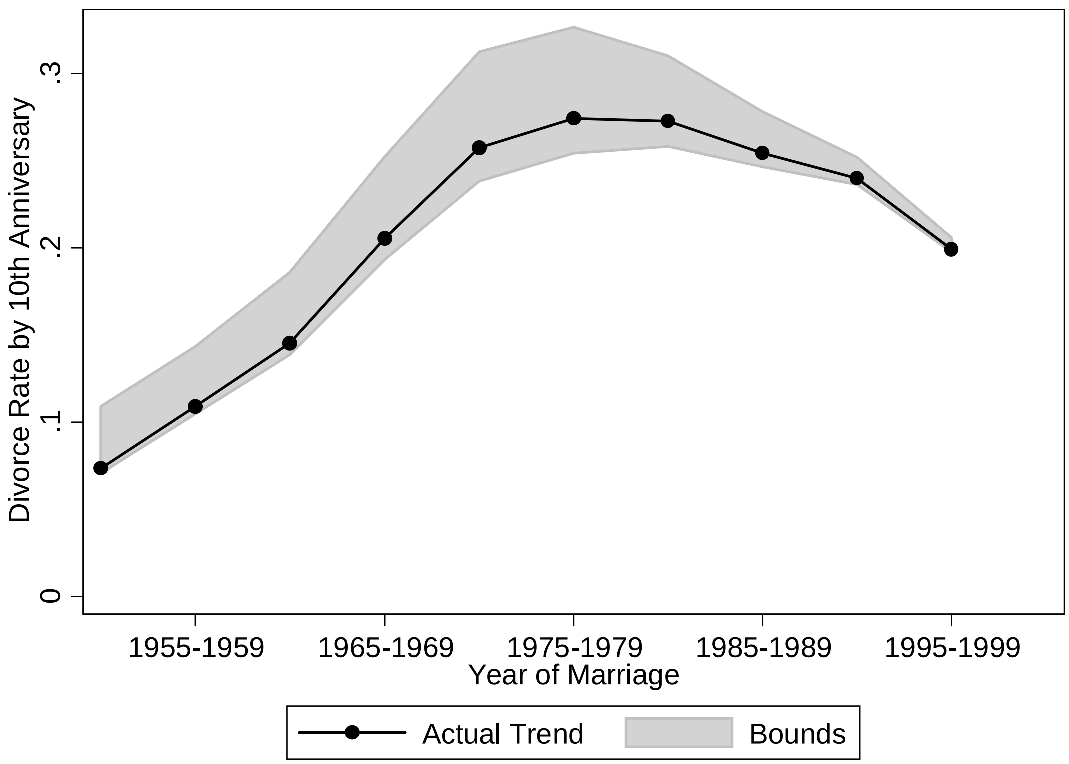
Notes and sources: Women's first marriages from the 2001, 2004, and 2008 SIPP, 1950-2004 (N=74,339). See Appendix A.1 for details. Effects are from a Cox hazard regression setting the hazard of divorce for marriages occurring from 1975 to 1979 to one. Observations censored at time of interview or time of death of spouse. Age at marriage controls include indicators for marrying under 18, 18-19, 20-22, 23-26, 27-29, 30-34, 35-39, and 40+. Robust standard errors used to calculate 95 percent confidence intervals.

Figure 3: The Relationship Between Age at Marriage and Divorce



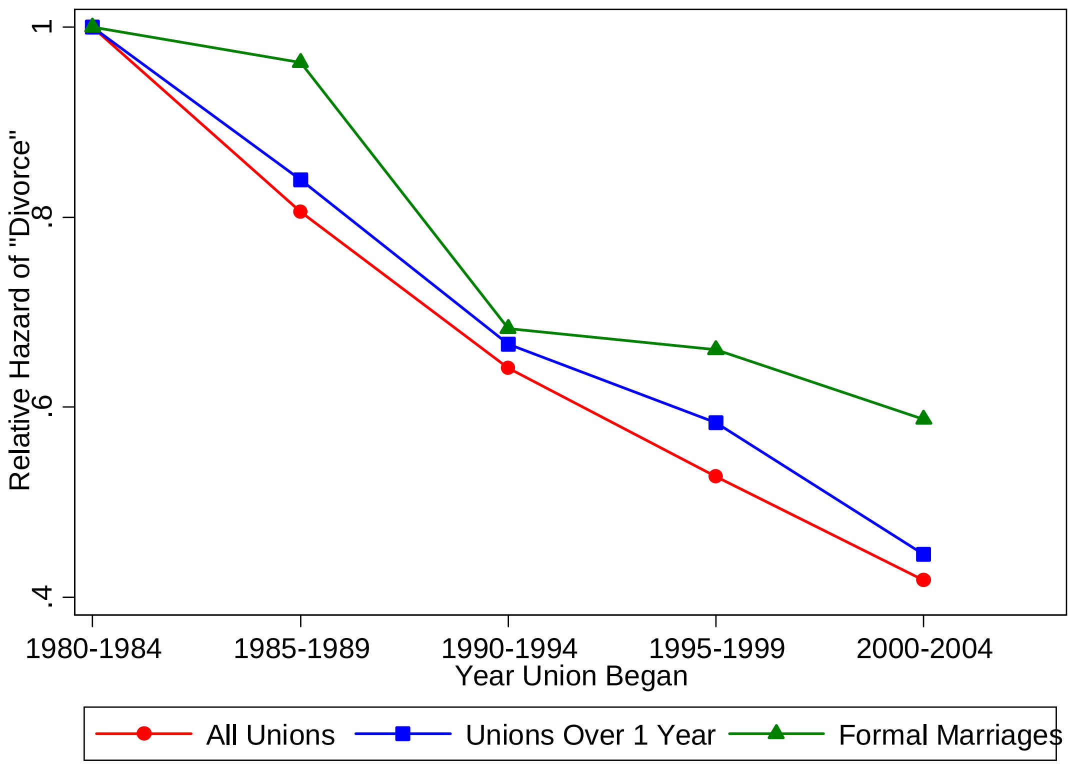
Notes and sources: Women's first marriages from the 2001, 2004, and 2008 SIPP, 1950-2004 (N=73,338). Marriage at age 22 is the baseline category. See Appendix A.1 for details. Observations censored at time of interview or time of death of spouse. Coefficients from Cox hazard regression also controlling for year of marriage fixed-effects, premarital childbearing, education at marriage (four groups), race (black, Hispanic, white, and other), census division and urban location (both at interview). Robust standard errors used to calculate 95 percent confidence intervals.

Figure 4: Bounds on Divorce Rates Occuring if Never-Married Women Married



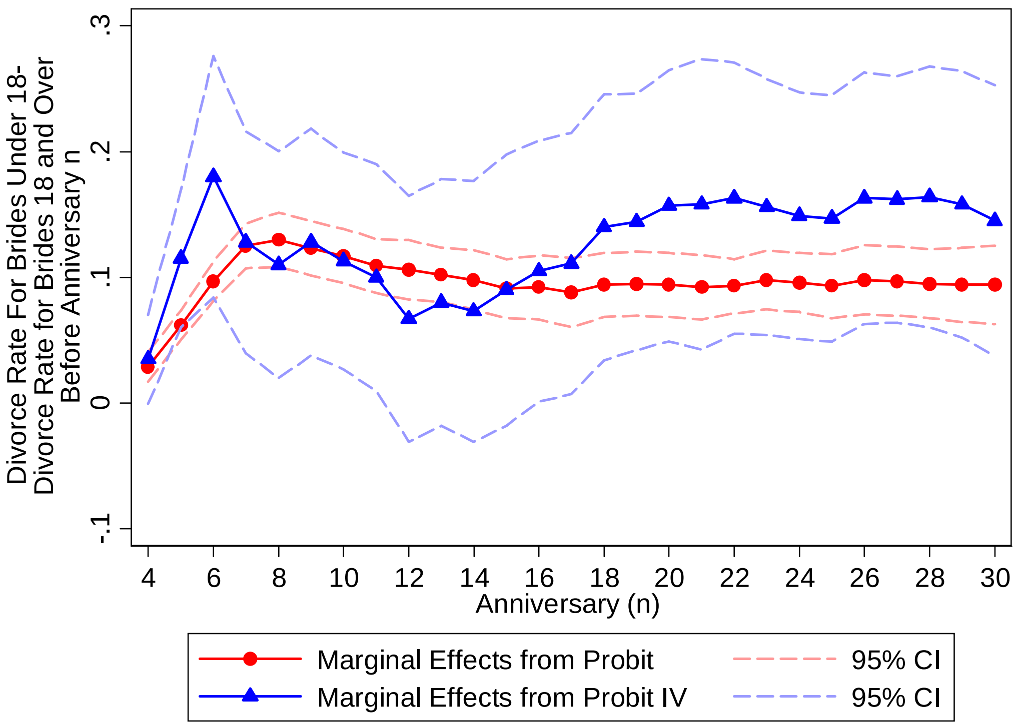
Notes and sources: Women's first marriages and never married women age 45 and older from the 2001, 2004, and 2008 SIPP, 1950-2004 (N=76,785). See Appendix A.1 for details. Bounds created by alternatively assuming that never-married women always or never divorce. I assume that the distribution of year of marriage is the same across those who marry versus those that do not by year of birth in allocating never-married women to dates of marriage.

Figure 5: Hazard Rates of Union Dissolution Across Cohorts



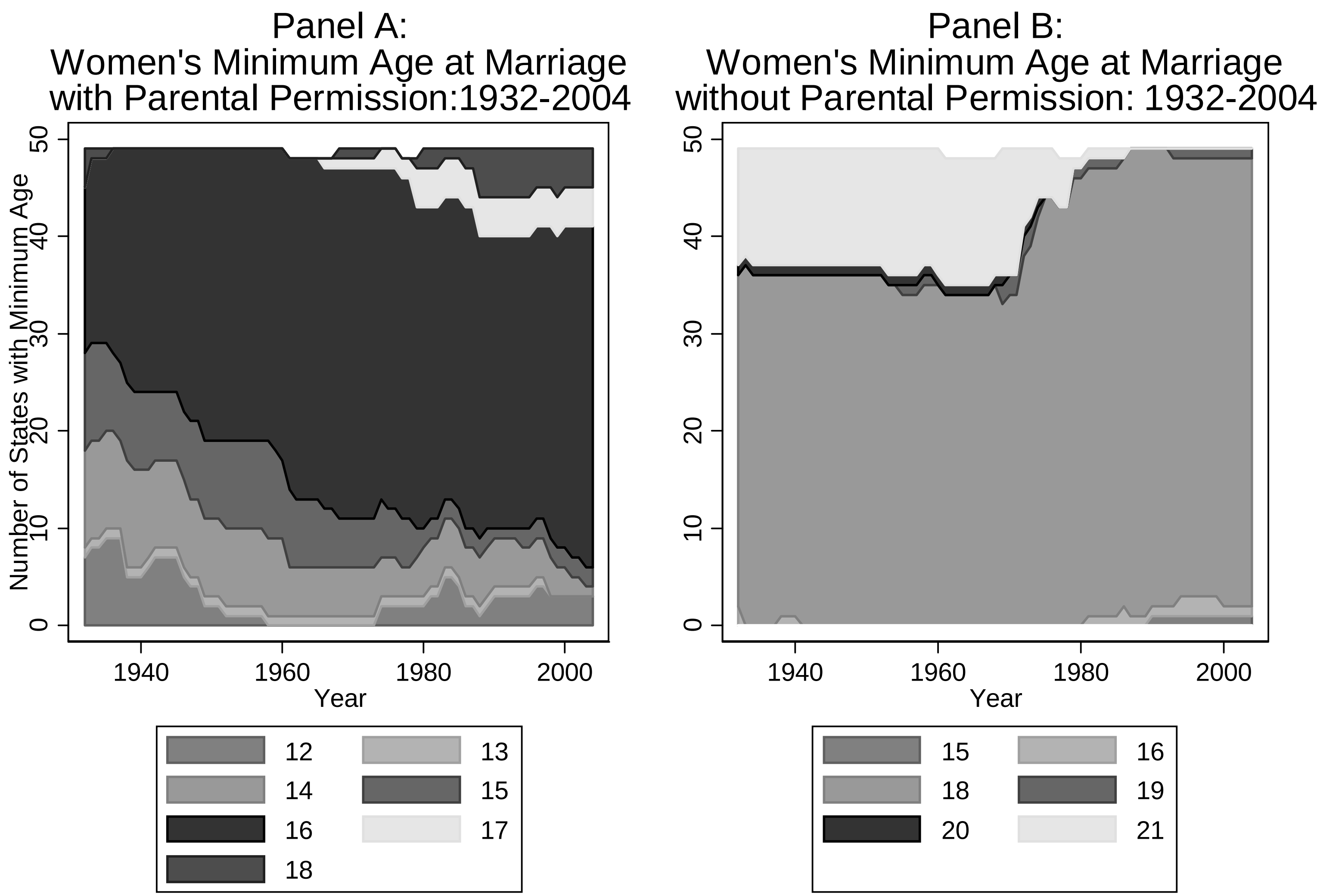
Notes and sources: Women's first marriages (N=11,933), unions (N=15,882), or unions over one year (N=14,381) from the 1988, 1995, 2002, and 2006-2008 NSFG, beginning 1980-2004. Unions defined as any formal marriage or cohabitation. See Appendix A.3 for details. Effects are from a Cox hazard regression setting the hazard of divorce for marriages occurring from 1980 to 1984 to one. Observations censored at time of interview or time of death of spouse. Regressions also control for survey date.

Figure 6: IV Estimates of the Effect of Marriage Before Age 18 on Divorce



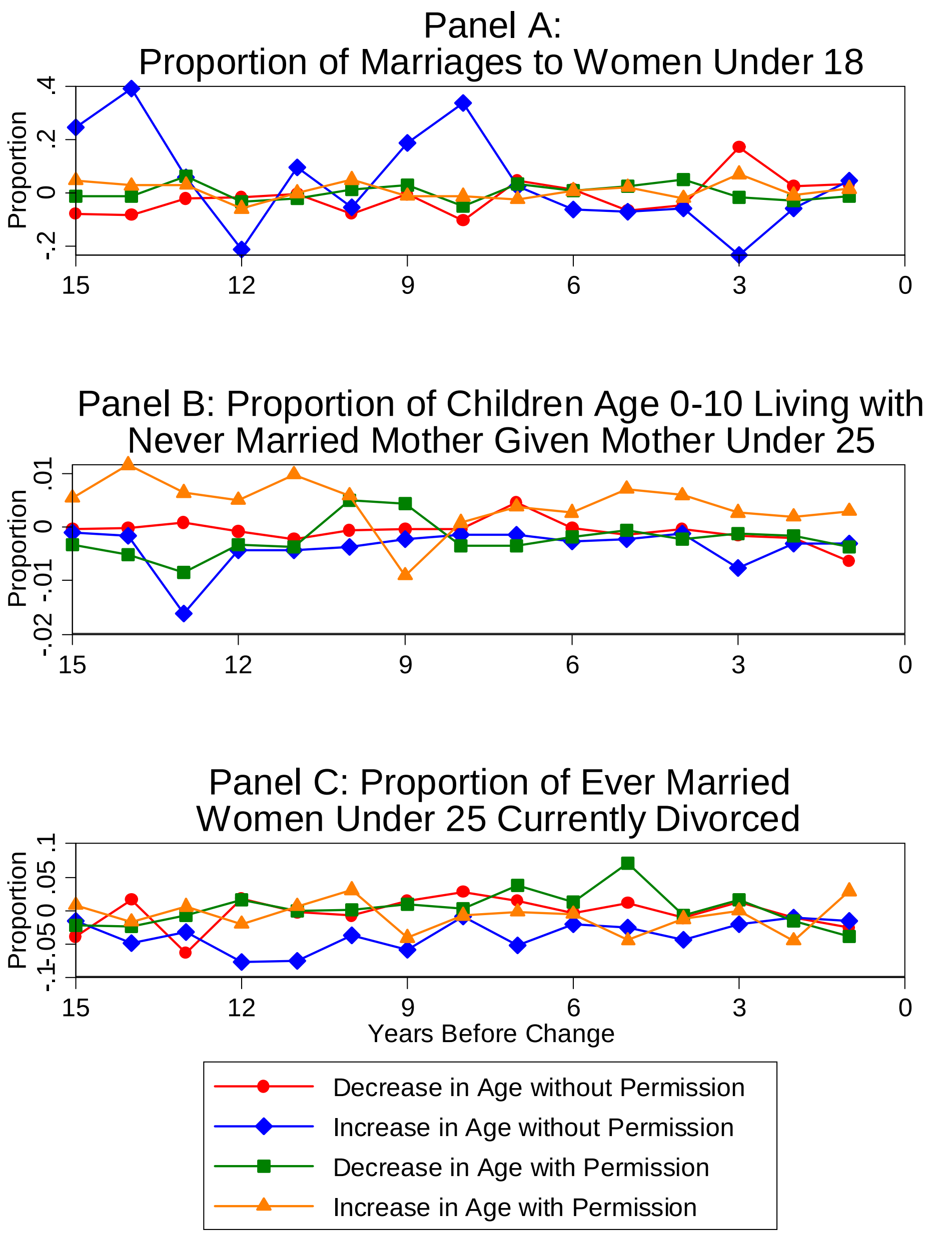
Notes and sources: Women's first marriages from the 2001, 2004, and 2008 SIPP (born 1920-1974, N=60,914). See Appendix A.1 for details. IV regression estimated using Maximum Likelihood, assuming regression stages have jointly normal errors. Observations included in estimating the effect of teenage marriage on the probability of divorce before the nth anniversary if the possible length of marriage (the difference between the date of spousal death or date of interview and date of marriage) is n or more years. Regressions also include year of marriage and state of birth fixed-effects and controls for having children prior to marriage, race (black, Hispanic, white, and other), census division and urban location (both at interview), and education (four categories). Robust standard errors clustered by state of birth used to create 95 percent confidence intervals. First stage using minimum age at marriage laws to predict age at marriage less than 18 in Table 6.

Figure A1: Minimum Age at Marriage Laws Over Time



Notes: See Appendix A.5 for details.

Figure A2: Young Marriage, Single Motherhood, and Divorce Before Changes in Marriage Laws



Notes and sources: See Appendix A.5 for details on law changes. Divorce and teenage marriage rates from CPS 1963-2004. Child living conditions from largest IPUMS Censuses (log-linearly interpolated for intercensal years). Residuals from regressions of given values on state and year fixed-effects plotted.