Education and the Timing of Marriage and Childbearing: a Comparative Study

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This paper, by examining the ways which changing timing of family formation varies by education in five European countries as well as the US, contributes to a more detailed understanding of family change in developed countries. My results indicate that declining marriage rates among women in their 20s appear to be near universal both within and across these societies, while the relationship between marriage and childbearing, and thus the impact of declining marriage rates, did not change equally. For some, the more educated women in these societies, marriage delay appears to be part of a larger pattern of the delay in family formation. For the least educated women, fertility delays were significantly smaller and often non-existent, resulting in an increasing concentration of childbearing outside of traditional wedlock at the bottom of the educational distribution. These results persist despite controls for school enrollment.

The second half of the twentieth century can be characterized by the rapid diversification of family forms and demographic behaviors throughout the West. Most remarkable of these changes are the continued fall of fertility in many European countries to extremely low levels, and the rising rates of both nonmarital fertility and cohabitation. Variability in family life appears not only at the country level (by levels of nonmarital fertility, total fertility rates or age-patterns of marriage and childbearing) but also within countries through the co-existence of many family structures. Despite a number of studies in the US demonstrate that not only family formation patterns but also the ways they have change over time differ significantly by educational attainment, surprisingly few of the theoretical debates and the empirical tests over the proper classification of recent family change in developed countries consider within-country variability

This paper applies the US approach of studying within-country differentials to a comparative study of the changing timing of marriage and first births, and of rising nonmarital fertility rates. By looking at cohort change and examining trends within countries, I will provide a more detailed description of family change in the US and Western Europe. My analysis shows a very similar pattern of change across the countries I examined – the educational differentials in family formation observed among the older cohort of women grew larger over time. While women under age 30, regardless of educational attainment or nationality, have delayed marriage; delayed fertility is concentrated primarily among more educated women, and nonmarital births have become increasingly concentrated among less educated women. My results suggest that there has been a similar pattern of family change across countries – one of increasing educational differentials in the link between formal marriage and childbearing.

Background and Questions

In contrast to the almost universal occurrence of fertility decline and the increased demographic homogeneity accompanying it, recent demographic change consists of increasing between- and within-country variability in marriage and fertility patterns. The rising rates of cohabitation, nonmarital childbearing, and divorce and declining rates of marital childbearing (Wu and Wolfe 2001) during this period have drastically changed the composition of American and European families. At country-level, large differences have appeared as well, with some countries experiencing extremely low fertility, others high rates of fertility outside of traditional marital unions, and some countries exhibiting both (Kohler, Billari, and Ortega 2002; Kiernan 2001)

In the US, although considerable family structure diversity is visible at an aggregate level, much of this results from differences in the family formation patterns of subgroups rather than differences extending within subgroups. Although one-third of all US births in 1999 were to unmarried women, the distribution varies considerably by race and education. Among African-American women, about 70 percent of births in the early 1990s were nonmarital (Wu, Bumpass, and Musick 2001). Despite rising white nonmarital fertility rates (Smith, Morgan, and Koropeckyj-Cox 1996), white women with Bachelor's degrees still rarely have out-of-wedlock births; about 90 percent of unmarried women in this subgroup are childless[1] (US Census 2001). Finally, divorce rates are lower among higher SES women (Kurz 1995). Patterns of *family change* also differ considerably by women's educational attainment. More educated women have delayed both marriage and childbearing, but childbearing remains largely within marriage and intervals between marriage and first birth have increased; less educated women, on the other hand, have delayed childbearing far less than marriage (Ellwood and Jencks 2001). The proportion of college-educated white women in recent cohorts who ever-marry may soon surpass that of less-educated white women; for African-American women this crossover has already occurred (Goldstein and Kenney 2001). In spite of the wide array of family structures in the US, the likelihood that a woman will fall into any

[1] About 75 percent of unmarried African-American women ages 35-44 with Bachelors degrees are childless; however the sample size is small (US Census 2001).

particular family type varies considerably by race and education – and thus the set of family types from which a woman selects appear to be determined in part by her social position.

European families have also undergone enormous change. Most striking are countries like Italy, Spain, and Greece with extraordinarily low fertility rates (current total fertility rates below 1.3) (Kohler et al. 2002), and Sweden and Norway where around half of all births were nonmarital in 1997 (Kiernan 2001). Nonmarital births in many European countries, unlike the US and England, typically occur within long-term cohabiting unions, and (although rising) remain almost completely absent in Greece, Switzerland, and Italy (Kiernan 2001; Heuveline, Timberlake, and Furstenberg 2002). Despite the label often given these changes, the Second Demographic Transition (by Van de Kaa 1987), and unlike the eventually universal fertility decline, there is as yet little evidence of convergence in family formation patterns among European countries (Billari and Wilson 2001). Billari and Wilson (2001) find no evidence that European countries are experiencing a "convergence to diversity", or a movement to similar age-patterns and variation of marriage and fertility, and in some countries employment, home-leaving, marriage and childbearing remain in tight sequence (Fussell and Gauthier forthcoming). Moreover, little is known about whether these changes are shared across educational groups within countries.

Although many explanations have been proposed for these changes (many variants on expansions in women's education and employment), they can be categorized into three main explanations. One stresses similar economic changes across countries, focusing on rising economic opportunities for women and increasing unemployment rates for men. Universal cultural change sweeping across the Western world, individualization and secularization, is a second frequently proposed explanation. Finally, long-standing cultural and policy differences between countries may profoundly effect demographic change – and ought to result in very different patterns of change between countries.

Educational and economic changes

Perhaps the most commonly given explanation for changes in family formation behavior, is the increasing economic independence of women (Oppenheimer and Lew 1995). Women's educational attainment has increased dramatically throughout Europe, and in the United States as well, and with it an increased amount of time is spent

enrolled in school (Blossfeld 1995). Women's employment has risen rapidly as well. By the mid-1990s, female labor force participation rates varied from a low of 43% in Italy to a high of 80% in Iceland (Brewster and Rindfuss 2000).

Studies of the relationship between education and family formation focus on two elements of education: the time spent in school and the actual degree attained. Theoretically, the roles of spouse or parent and the responsibilities they encompass may be incompatible with the student role, which typically includes economic dependence on parents, limited economic resources, and is transitory in nature (Rindfuss, Morgan, and Swicegood 1988; Thornton, Axinn, and Teachman 1995; Blossfeld and Huinink 1991). In the US, including a measure of school enrollment changes the direction of the relationship between marriage and educational attainment, from negative to positive (Thornton et al. 1995); while in a number of European countries (West Germany, Britain, Sweden, Netherlands) educational attainment was unrelated to marriage and childbearing in models that included a measure of school participation (Blossfeld and Huinink 1991; Gustafsson, Kenjoh, and Wetzels 2002). Since rising ages at marriage and first birth can result simply from the increased educational attainment or increased time spent in school, studies of trends in family formation must include controls for the changing educational and school enrollment composition of cohorts.

Educational attainment (or accumulation) may also affect women's family formation patterns. Becker (1991) argues that improved employment opportunities for women increased the opportunity costs of childbearing while making the specialization model of the traditional breadwinner/homemaker family less efficient. The result: rising divorce rates, declining marriage and fertility rates. Other economists and sociologists recognize not only the conflicts between work and family for women (opportunity costs of motherhood) but also the potential income effects resulting from women's employment. The greater earning potential of more educated women may make them more attractive spouses (Thornton et al. 1995), and may make childbearing more affordable (Macunovich 1996). Finally, some have hypothesized that women with different educational attainment levels may value family and work in different ways – more educated women may prioritize their careers more so that those with less education for whom family formation may view motherhood as more immediately fulfilling (Gustafsson et al. 2002).

The evidence cited above suggests that, at least once the time spent pursuing degrees is controlled for, the more educated women are not less likely to marry or to have children as an opportunity-cost approach or values would suggest. In addition, several studies suggest that the relationship between education and family structure varies across countries. Kathleen Kiernan found that the cohabitation was more likely among highly educated women in some countries, less likely in others, and was unrelated in still others (Kiernan 2000). With respect to childbearing, Kiernan (2001) found that in France college-graduates were significantly *less* likely to have a birth outside of any union than those without at least a high school degree (equivalent), while in Italy college-graduates were significantly *more* likely to have a non-union birth.[2] Blossfeld et al (1995) also find a strong positive effect of higher educational attainment on marital separation in Italy, with a smaller effect in Germany, and the smallest (possibly insignificant) effect in Sweden.

But these studies share an important limitation – they typically assume that the effect of education is static over time, and, if they examine family change, they assume cohort changes are similar across educational groups. Empirical studies of family change that include main effects of birth cohort and of education (and typically enrollment status), but no interactions, force the effect of education to be constant across cohorts and the effect of cohort to be constant across educational attainment. US research suggests that there are important differences in the patterns of change by educational attainment and the educational differentials are growing.

Several authors (Ellwood and Jencks 2001; Rindfuss, Morgan, and Offut 1996; Buchmann 1989) argue that the combination of male economic opportunities and female economic opportunities for women in different positions in the educational structure can in large part explain observed differences in the timing of marriage and fertility in the US:

1. *Long delays in the fertility of college-educated women* are the result of a conflict between their educational and career investments and investment in families; because of the career-ladder structure of the jobs they typically hold, early investments are important and early fertility is hypothesized to have long-term repercussions for career success. Fertility, however, tends to be within marriage because there is no shortage of "marriageable men" for highly educated women.

[2] Among the eight countries Kiernan (2001) examines, countries also seem to differ in the direction of the relationship between education and the proportion of first births that are marital.

2. *Earlier nonmarital fertility among less-educated women* is hypothesized to result from the shortage of marriageable men, which makes marriage unlikely, and the economic opportunities of less-educated women are thought to be less sensitive to early investments.

As the authors demonstrate empirically, this set of hypotheses presents a concise explanation that seems to fit recent changes and differentials US family formation. Buchmann (1989) extends this theoretically (but not empirically) to other industrialized nations on the assumption of shared macro-structural change.

Although a direct test the economic explanations underlying these hypotheses is beyond the scope of the paper, I can test for the predicted patterns of family change.

A Second Demographic Transition?

The key argument in most cultural explanations following the first approach is that of a long historical process of individualization and secularization in which the balance between social obligations (to family, to community, to country) and individual self-interest has shifted in the direction of great self-interest (Lesthaeghe 1983; Popenoe 1993; Swidler 1980). Proponents present aggregate data on attitudes to demonstrate value changes including greater acceptance of voluntary childlessness, greater approval of women's employment, and increased acceptance of pre-marital intercourse (Lesthaeghe 1983; Popenoe 1993). The result of increased individual freedom in family formation decisions and self-fulfillment as the basis of these decisions, is greater variability in family structure, possibly to the detriment of the institution of marriage, dependent children and social collectivities (Lesthaeghe 1983; Popenoe 1993; Waite and Gallagher 2000; Waite and Gallagher 2000). Although many of these authors believe that economic change plays an important causal role in the development of new cultural beliefs, they argue that ideational change plays an important independent role in family change.

In the US context, a number of criticisms of this idea have been raised. Perhaps the most significant problem facing this theory of broad cultural and demographic change, however, is that demographic change appears to be less sweeping than described. In the US, it is not clear that the causal elements Popenoe identifies (women's employment and increased self-investment) operate for the same social groups as the family change (nonmarital childbearing, divorce, and declining marital fertility) he fears (Kurz 1995). The comparative literature faces a similar problem with individualization theory—although nonmarital fertility and divorce rates

have risen in all countries, fifteen years after Van de Kaa described the second demographic transition, these remain rare events in many European countries (Billari and Wilson 2001; Heuveline et al. 2002). In Spain, attitudes appear to have changed in the direction predicted by individualization theory, but without significant demographic change (Baizan, Michielin, and Billari 2001).

Once again, this paper only indirectly assesses this theory of family change. To the extent that family change varies systematically within countries, or that the patterns of family change differ significantly across countries, shared cultural change alone must be an insufficient explanatory variable. Instead, as Buchmann (1989) argues, the combination of new values (greater freedom in family formation) with new economic realities that differ by education may results in new family formation patterns that differ by education (long delays in family formation, or choosing to bear and raise children outside of marriage.)

Country- and Region-specific alternatives

Differences in government policies, long-standing cultural differences, or other institutional factors (like women's status, the division of household labor) may mediate the relationship between and education -based economic opportunities and marriage and fertility outcomes.

Policy and cultural differences between countries may play an important role in understanding why family change may vary between countries. Countries vary in the relationship between the family and the state – states vary considerably in the amount of aid given to families, the population eligible for such aid, the degree of support to working mothers or to stay-at-home moms (Gauthier 1996) Esping-Andersen (1990; 1999) identifies three welfare state regimes: liberal, social democratic, and conservative. Liberal welfare regimes, as exemplified by the US, are characterized by their emphasis on individual responsibility, limited and means-tested state support for families, and significant reliance on markets to provide welfare (e.g. health insurance for instance). Conservative welfare states (including Italy, France, and Germany) are characterized by limited redistributive powers, but the state rather than the market is the primary provider of welfare. Gauthier (1996) points to an importance differences in family policies within this group – German non-interventionalist approach except to support the traditional family, and France's pronatalism. Southern Europe, because of the low levels of family

benefits and expectation that families will provide basic welfare, appears to be distinct from the rest of Continental Europe (Gauthier 1996; Reher 1998). Finally, in Esping-Andersen's social democratic regime, found among the Nordic countries, the state promotes "an equality of the highest standards, not an equality of minimal needs as pursued elsewhere." (Esping-Andersen 1990: 27). Family benefits, for instance, are high and given universally (Esping-Andersen 1990), and single-parent families do not experience the higher levels of poverty seen in the US (Bradbury and Jantti 2001).

These policy differences may have an important impact on both the overall pattern of change in a country and the educational differences within countries. For instance, where women must leave the labor force upon motherhood (because of structural factors – including work, day care, and school schedules and availability – or cultural beliefs about appropriate parenting) or where men assist little in child care or housework, they often choose to delay parenthood in order to extend their labor force participation (Brewster and Rindfuss 2000; Tsuya and Mason 1995). Thus, if cultural or policy differences are driving family changes, we would expect to see large differences between countries in the patterns and levels of change.

Data and methods:

Data

I use data from the Fertility and Family Surveys (FFS) – similar cross-sectional surveys conducted in 23 countries (primarily European countries, but also the US, Canada, and New Zealand). Most of the surveys were conducted between 1992 and 1997.[3] In most countries at least 2500 women of reproductive ages were interviewed. (See Table 1 for the years of data collection, and sample size). For this paper, I use data from five Western European countries (Italy, Spain, France, Germany, and Norway) and the US[4]. These countries were chosen to represent a wide range of policy environments as well as fertility and nonmarital fertility levels. I analyze African-Americans and whites in the US separately because their family formation patterns differ in

[3] The US data is actually from the 1995 National Survey of Family Growth and was adapted after data collection to fit the FFS format.

[4] I have also examined data from Portugal – unfortunately, Portugal did not collect complete union histories so only fertility behavior can be compared with other countries.

important ways. Following other researchers, I also analyze the former East and West Germany separately – the data were collected in 1992, shortly following the union of these two states. I include East Germany, in part, to provide a contrast – the social and economic changes experienced by the citizens of this former socialist state were likely quite different from those in West Germany and in Western Europe as a whole.

The main advantage of FFS data is the availability of comparable retrospective fertility and partnership histories for women of childbearing ages in each country. I am able to examine, for different cohorts of women, the age-patterns of marriage and fertility and the relationship between marriage and childbearing. Although younger cohorts will have not yet completed family formation—and thus distinguishing between postponement and births/marriages forgone is problematic—I can compare the younger cohort's union and childbearing behavior before age 30 behavior to older cohorts at similar ages. The data sets also contain educational attainment and histories for each respondent. The primary disadvantage of the FFS is the lack of current data – the data are about 10 years old. However, the FFS remains the best source of comparable family formation data available for a large number of countries and these data encompass a period of significant demographic change and educational change for women.

[Table 1 about here]

My dependent variables are entering a first marriage and having a first birth. The models I present here include just three independent variables – age, educational attainment and cohort. Age is measured in 3 or 4-year intervals from age 14 and higher. In each country, I define two cohorts – typically those born before and after 1965. (See Table 1 for the exact cohort definitions.) I analyze data only for women ages 22 and although some of the women (particularly those with secondary degrees) are still enrolled in school. I have tested different birth cohorts and cut-offs ages for inclusion in these models with similar results.

I use educational attainment at the time of the survey and these models do not include measures of school enrollment. Educational attainment was collected using the ISCED system and measures primary level (elementary or middle school only), two levels of "secondary" (high school), and 3 levels of post-secondary education (education not leading to a university degree, a university degree, or a graduate degrees). I have collapsed these codes into 3 levels – pre-secondary, high school or secondary graduate, and post-secondary or

university education. Clearly these levels are not directly comparable across countries –the US, for instance, awards high school and university degrees at an earlier age than most European countries. However, despite important differences in the educational systems of the countries I include in my analysis, by focusing on patterns of change within-countries and on the general hierarchy of educational attainment (more or less), the lack of direct comparability is less important than it might otherwise be. The results here support this approach – although whether high school graduates resemble women with more or less education varies across countries, as educational levels increase, family formation patterns differ in systematic ways.

My models include two variables as controls: a time-vary measure of school enrollment and an indicator of labor force participation. The school enrollment variable is equal to one if a woman was enrolled in school at a particular age. The employment indicator is not time-varying and is equal to one if the woman ever participated in market work during the period prior to either her first marriage or birth, or at any point prior to the interview.

These controls ensure that changes in the duration of schooling or of the entrance of women into the labor force are not driving my results. This study, however, is primarily a descriptive test of whether the patterns of family change in other developed countries follow the US pattern as described by Buchmann (1989) and Ellwood and Jencks (2001). By providing a more complete description of recent family change, I can highlight potential strengths and weaknesses of the predominant explanations for family change.

Methods

In the analyses presented here, I use logistic regression to estimate discrete-time event history models predicting marriage, first births, and nonmarital first birth (Allison 1995). This method is modeled on the approached used by Raymo (2003) in a study of the relationship between educational attainment and marriage in Japan. Following his approach, I estimated a series of nested logistic regression models for each country – starting with a main effects model of age, education, and cohort. Then I gradually added interactions between these variables, which relax the proportional odds assumption of the first model (Raymo 2003) – these allow the association between education and family formation vary by age and by cohort, and the amount of cohort change

to vary by age. The models I present here (for marriage and first birth) here include all two-way interactions, but not the three-way interactions – and have the form:

$$\ln[p_{it}/(1-p_{it})] = B_1AGE_i(t) + B_2EDUC_i + B_3COHORT_i + B_5(AGE_i(t) \times EDUC_i) + B_6(EDUC_i \times COHORT_i) + B_7(AGE_i(t) \times COHORT_i) + B_8SCHOOL\ ENROLLMENT_i(t) + B_9EMPLOYMENT_i$$

These are comparable to Raymo's model 4. I found that in countries where nonmarital births were rare, estimating the full model was not possible.

The coefficients that I will focus on in my discussion are the main effects of cohort and the education*cohort interaction. The interaction between education and cohort allows me to test the primary hypotheses discussed above – that fertility delays are significantly larger for more educated women, that everyone, regardless of education, is delaying marriage, and that nonmarital childbearing has increased more among the least-educated women in a country. Because I code my independent variables as dummies (0 and 1), the main effect of cohort represents, for the omitted education category – post-secondary education for marriage and first birth models, secondary level for nonmarital first birth -- the difference in the log-odds of an event between the older and younger cohort. The interaction coefficients are the additional effect of cohort for women with different educational attainment levels. To get the total cohort difference for the primary level group, for example, I add together the main effect of cohort and the interaction between cohort and primary education.

The age* education interaction allow the effect of education to vary by age – for instance allowing college-educated women to have lower first birth rates at younger ages and higher rates at older ages compared to less educated women. Excluding this interaction is equivalent to forcing the effect of education to be constant at all ages. In addition, I estimated an interaction between age and cohort – this allows the change in marriage or childbearing to vary by age (for instance a decline at younger ages and an increase at older ages.) Without a two-way interaction the changing age-pattern of fertility is forced to be the same for women regardless of educational attainment. In general, the three-way interactions were not significant, and even when significant they did not change the overall conclusions.

To estimate these models I created separate data files for each dependent variable. These files contained one person-year of observation for each year at which an individual was at risk of the relevant event. I censor observations are censored at either time of the event or at the time of the survey.

Marriage

Across these countries, the delay in marriage is nearly universal. Table 2 shows the percentage of women who have married before ages 20, 25, and 28 among those at least aged 20, 25, or 28 years at the time of the survey. (For Norway, I use age 27 – as the number of women aged 28 was too small). The sample sizes by education are worth noting – since they are typically between 30 and 100 at age 28 for the younger cohort.

Overall and within educational levels, women are marrying later and (at least as of age 28) less. For the older cohort, consistently three-quarters of women married by age 28 (the exception African-Americans). For the younger cohort, US blacks have the lowest rates of marriage with only 44 percent of those 28 and older married by age 28. In Norway, France, and West Germany barely more than half of the younger cohort married by age 28. East Germany looks quite different, with 79 percent married at this age. For the remaining countries and for US whites, between 60 and 69 percent had married. Marriages before age 20 are now rare across the board.

[Table 2 about here]

The complete results for the logistic models are shown in Table 3. Adding together the main effect of cohort and the coefficients for the interactions with cohort results in an estimate of the amount of delay in marriage for by age and education. These results indicate that the likelihood of marriage has declined at virtually every age (up to about age 30) for the later cohort and across educational groups.

[Table 3 about here]

United States: In the US, both whites and African-Americans show a significant decline in their propensity to marry by age 31. Younger college-educated white women, for instance, were less likely to marry at every age than the earlier birth cohort. The odds that a first marriage occurred between ages 23 and 25 for college-educated women decreased by over 20 percent between cohorts and the declines at younger ages were

significantly larger.[5] Although less-educated white women also experienced declining risks of a marriage, the magnitude of change was significantly smaller at all ages for high school graduates. At ages 23-25, for instance, high school graduates demonstrate no net change in their marriage propensities. The amount of marriage delay did not differ between women without high school degree and college-educated women.

The overall changes in marriage formation patterns can be seen in Figure 1a. This figure, based on lifetable estimates, shows the proportion women unmarried at given ages, stratified by education and cohort. **[note: these are raw data; I plan to present similar graphs that are based on the event-history models and will send those to you when they are complete].** The longer, colored lines represent women in the earlier cohort, while the shorter lines represent women born after 1965. All three educational subgroups show substantial delays in marriage formation.

[Figure 1a about here]

African-African women also show a dramatic decline in marriage rates at all ages (shown in Table 3 and Figure 1b). Unlike white women, however, the amount of cohort change was similar across educational attainment levels.

[Figure 1b about here]

Southern Europe: Both Italy and Spain have experienced significant declines in marriage rates, and in both cases more educated women experienced significantly larger delays or declines. Italy shows the greatest change: for younger women with at least a secondary degree, the odds of a first birth are less than half at every age compared to the older cohort. For women without secondary degrees, the magnitude of cohort change is significantly smaller; at every age, however, they too were less likely to marry than earlier cohorts. The dramatic nature of the delay in marriage is evident in Figure 1c.

[Figure 1c about here]

[5] Because college-education and ages 23-25 are the omitted categories in these models, the percentage change in the odds ratio for college-educated women at ages 23-25 can be estimated from the main effect of the cohort variable: 21.4% = (100*(1-$e^{-0.2405}$). The percentage changes at other ages can then be estimated by adding the appropriate cohort*age coefficient: for ages 15-19 the decrease in marriage likelihood was substantially higher: 54.1% = 100*(1-$e^{(-0.2405)+(-0.538}$). Finally, to estimate the amount of change for other educational subgroup, the cohort*education interactions are added to the value for college-educated women in a particular age interval.

Spain is the exception to the conclusion that marriage has declined across subgroups in all countries[6]. Although women with at least secondary degrees were significantly and dramatically less likely to transition into marriage at all ages, women who did not complete high school (the model educational category) show relatively little change. The odds ratio of a first marriage during ages 15-19 was about 1.3 indicating a 30 percent increase in marriage during teen ages for this group of women; by ages 23-25, however, the risk of marriage declined by about 40 percent between the two cohorts. The large declines in marriage for more educated Spanish women, and the relatively smaller change for women without high school degrees in shown in Figure 1d.

[Figure 1d about here]

Continental Europe: France, as well as the former East and West Germany, show significant declines in marriage rates at all ages and across education for the younger cohort. In France, all women are delaying marriage by similar amounts. In West Germany, all women are delaying marriage, although the women without high school degrees have a significantly smaller delay than college educated women. Finally, in the former East Germany, women regardless of education appear to be experiencing similar declines in marriage probabilities.

[Figures 1e, 1f, and 1g about here]

Norway: Norwegian women, like women in all the other countries, are significantly delaying or forgoing marriage at all ages. This pattern of cohort change is similar across educational levels.

[Figure 1h about here]

In sum, with the exception of the least educated women in Spain, a substantial decline in marriage rates has occurred at all ages and in all countries examined here. By age 29, the younger cohort shows no inclination to catch-up with their elders, since the risk ratios typically remain below one even through the late 20s. Although this decline in marriage is near universal, in general, more educated women experienced the largest delays or declines in marriage. Only among African-Americans, and in Norway and East Germany, is the magnitude of change is the same for all women regardless of background.

[6] The results from Portugal were quite similar – women with primary level education did not delay marriage, while better educated women did. However, the analysis was restricted to women who had not cohabited prior to marriage as the Portuguese survey collected no data on the date of marriage for these women.

First births

Unlike marriage, a decline in first birth probabilities was far from universal. Looking first at Table 4, the proportion of women making the transition to first birth by age 28, has fallen across the board (except in East Germany and Norway). But, among women without secondary degrees, although generally first births decline, many of these changes were small in magnitude and at some ages there have even been increases in the proportion having their first birth.

[Table 4 about here]

Unlike the previous marriage findings, only college-educated women have consistently delayed first births (the one exception is Norway where there is no evidence of fertility delay for any educational group) (see Table 5). Also, in most models, I found significant interactions between education and cohort (see the full results in Table 5). These interactions demonstrated that fertility delays were more commonly among more highly educated women. Women without secondary degrees frequently show no change in the timing of first births.

[Table 5 about here]

United States: Among white women, only college-educated women show any significant delay in childbearing (see also Figure 2a). These different patterns of cohort change were highly significant change were highly significant. The interaction between age and cohort was insignificant, indicating that the amount of change was about the same at every age. College-educated women, by age 30, have not yet started to catch up with their elders.

[Figure 2a about here]

African-American women demonstrate little change in the timing of first births. The cohort effect for college-educated women is negative but not significant. There was a significant difference in the magnitude of cohort change between college-educated women and women without secondary degrees. The net cohort change was positive (0.12 = -0.23 + 0.35) for the least-educated women in this sample. As among white women, there was little age-variation in the degree of cohort change. Thus, for African-American women, who showed a dramatic decline in marriage across all education levels, fertility changed not at all for women without university educations, and the decline for even the college educated women was insignificant.

[Figure 2b about here]

Southern Europe: Southern Europe has received considerable attention for their extremely low total fertility rates (Kohler et. al 2002). This dramatic drop in childbearing is evident in Table 5 and in Figures 2c and 2d. Among younger college-educated women in Italy, just 3 percent had had a birth by age 28. In Spain, the percent making this transition rises to just 14 percent. However, the differences by education are huge. Among women without secondary degrees, 60 percent of the younger cohort had become mothers in Italy, and 70 percent in Spain. These two groups of women represent one-third and one-half, respectively, of women in the younger cohorts.

[Figures 2c and 2d about here]

In Italy, the odds of a first birth declined for women across educational attainment levels and at essentially all ages (Table 6). The magnitude of this change differed significantly by women's educational attainment. Younger college-educated women were 80 percent less likely to have a first birth during ages 26-28 than similarly educated women in the older cohort. High-school graduates were about 60 percent as likely to give birth during this age interval, while women with primary education experienced only a 30 percent decline.

Spain looks somewhat different. Women without secondary degrees in both countries experience little change in first birth rates, while women with more education show significant delays in the transition to motherhood. These results are consistent with the marriage results – Spanish women without secondary degrees were the one group that did not show a large decline in marriage. The results for Portugal (not shown) closely resemble those of Spain[7]. Portuguese women with secondary degrees also have significantly smaller declines in first birth rates compared to college-educated women. Thus, in these two low fertility countries, fertility delays and declines are concentrated among the more educated women, and as of the mid-1990s had not spread throughout each society.

Continental Europe: In France and the former West and East Germanies, significant declines in first birth hazards can be found only among women with at least secondary degrees (although in West Germany this result

[7] The Portuguese fertility data, but not union histories, are complete. As a results, I could estimate the first birth models, but not marriage or nonmarital childbearing models.

is significant only if high school graduates and the small numbers of college graduates are combined into one category). The least educated women in both these regions demonstrate a different pattern of cohort change in fertility (although this difference is not significant in West Germany). In France, women with secondary degrees also experienced a significantly smaller decline in fertility than women with university educations.

[Figures 2e, 2f, and 2g about here]

Norway: Fertility patterns in Norway have changed little between the two cohorts. College-educated women in Norway show no significant change in their likelihood of a first birth (net of the overall age-pattern of cohort change). Both groups of less-educated women show a significantly different age-pattern of change, and the net effect for both groups is in the direction of slightly earlier and higher rates of childbearing.

[Figure 2h about here]

Across these European countries, delays in fertility are concentrated among women with the most education. Italy appears to be distinct, because of the large declines in fertility found even women with primary levels of education. Yet, even in Italy, the magnitude of the timing change was significantly higher among more educated women, and still 60 percent of the least-educated women had a first birth before age 28. Finally, Spain (and Portugal), despite its low-low fertility status, look surprisingly like other, higher fertility countries, when the within-country patterns of change are considered. Women without secondary degrees, the modal educational group in these two countries, show little or no change in the timing of first births.

Discussion

Education has always had a strong relationship with family formation. This strength of this relationship, however, appears to have grown in recent years. When I compare the timing of fertility of those born before and after the early 1960s, across virtually all countries in this analysis, the differences have grown.

Perhaps the most dramatic change is the marriage of women under the age of 30. Regardless of education or national origin, virtually all groups of women are delaying marriage and perhaps forgoing marriage altogether. For several countries, marriage rates during the teens and 20s declined more among better educated women than women with fewer educational credentials.

The transition to motherhood changed much less than marriage and did not change for all subgroups. Only among college-educated women could I find a near universal decline. For women with just a primary level of education, changes were small in magnitude if family formation changed at all. Most surprisingly, even in the very low fertility countries of Spain and Italy, 60-70 percent of women without high school degrees had become mothers by their late 20s. With the exception of East Germany, I consistently found that the delay or decline in first births was significantly larger among more educated women.

Although decline/delay in marriage appears to be near universal both within and across these societies, the relationship between marriage and childbearing, and thus the impact of declining marriage rates, did not change equally. For some, the more educated women in these societies, marriage delay appears to be part of a larger pattern of the delay in family formation. For the least educated women in nearly all of these countries, marriage delay was not accompanied by a delay in the age at first births. Legal marriage, for these women, has become decreasingly associated with family formation. The most obvious exceptions are found in Southern Italy, where nonmarital births remain rare.

This paper had two main goals: first to describe in greater detail the patterns of family change in the US and Europe, and second to use this description to assess the adequacy of the current theories of family change. If there is an explanation for family change in these countries, it must incorporate educational differences. Even, for marriage, where change was near universal, when placed in the context of differential fertility change, the reason more educated women are delaying marriage is unlikely to be the same as the reason the least educated women are delaying marriage. The findings here support, at least descriptively, the Ellwood/Jencks and Buchmann argument that a different set of explanations is needed to explain the changing family formation at the top and bottom of the educational hierarchy. Further research is necessary to examine their specific hypotheses: that more educated women are delaying family formation during the prolonged period of educational and career investments; and that less educated women, while experiencing fewer conflicts between childbearing and careers, face instead the declining economic prospect of potential marriage partners.

These findings, however, do not indicate that cultural change or policy environments are unimportant. The universal cultural change Lesthaeghe (1983) describes may have given women the freedom to both delay

family formation and to form new types of families. But, it is an insufficient explanation for the patterns of family change I describe. Given the large country-level differences in the levels of marriage, childbearing, and nonmarital childbearing and in the magnitude of cohort change, policy and institutional differences likely will play an important explanatory role. Spain, for instance, ranks near the bottom in cash benefits provided for families leaving extended families to act as a safety net (Gauthier 1996; Reher 1998).

This research is just a first step in describing and understanding contemporary family change. Unfortunately, much more may have changed in the decade since these data were collected. My younger cohort, at the time of the survey, still has many reproductive years ahead. In the US, college-educated women have dramatically increased their rates childbearing after age 30 (Martin 2000), while Goldstein and Kenney (2001) predict the levels of marriage for college-educated women may eventually surpass those of the less educated. Moreover, I have ignored the important role cohabiting unions play in the decline of marriage and in the growth of nonmarital births. The findings from this paper do, however, show that dramatic changes have occurred in family formation, and that education must play a key role in understanding how and why marriage and childbearing are changing.

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Table 1. Sample Characteristics

Country	Survey year	Birth cohorts	Sample Size
United States	1995	1950-64; 1965-73	7766
Italy	1995-96	1946-64; 1965-74	4647
Spain	1994-95	1950-64; 1965-73	4021
France	1994	1944-63; 1964-72	2944
West Germany	1992	1952-61; 1962-70	2566
East Germany	1992	1952-61; 1962-70	2537
Norway	1988-89	1945, 1950, 1955; 1960, 1965	4019

Table 2. Proportion of women who married by age, education, cohort, and country

Country	US whites				US blacks				Italy				Spain			
	Older		Younger		Older		Younger		Older		Younger		Older		Younger	
	n	prop.	n	prop.	n	prop.	n	prop.	n	prop.	n	prop.	n	prop.	n	prop.
Overall																
Age 20	3760	0.32	1814	0.17	1325	0.22	809	0.11	2883	0.19	1764	0.07	2337	0.14	1372	0.13
Age 25	3760	0.68	1021	0.56	1325	0.43	475	0.31	2883	0.64	1050	0.38	2249	0.64	811	0.47
Age 28	3760	0.79	472	0.69	1325	0.53	220	0.44	2883	0.78	539	0.60	2249	0.82	385	0.68
< HS degree																
Age 20	454	0.67	199	0.44	298	0.27	187	0.15	1550	0.28	583	0.16	1701	0.18	739	0.22
Age 25	454	0.85	110	0.77	298	0.38	103	0.24	1550	0.78	377	0.59	1654	0.70	454	0.66
Age 28	454	0.89	46	0.73	298	0.41	51	0.30	1550	0.88	209	0.76	1654	0.86	230	0.81
HS graduates																
Age 20	1343	0.41	569	0.25	481	0.25	299	0.15	998	0.10	1053	0.02	319	0.09	329	0.04
Age 25	1343	0.77	326	0.70	481	0.48	187	0.40	998	0.54	561	0.30	281	0.58	172	0.34
Age 28	1343	0.84	146	0.81	481	0.57	93	0.51	998	0.73	267	0.58	281	0.75	74	0.59
College-educated																
Age 20	1963	0.17	1046	0.07	546	0.16	323	0.06	334	0.03	128	0.00	317	0.03	304	0.01
Age 25	1963	0.57	585	0.44	546	0.41	185	0.28	334	0.24	112	0.07	314	0.38	185	0.15
Age 28	1963	0.73	280	0.61	546	0.56	76	0.44	334	0.50	63	0.17	314	0.65	81	0.40

Country	France				W. Germany				E. Germany				Norway*			
cohort	Older		Younger		Older		Younger		Older		Younger		Older		Younger	
	n	prop.	n	prop.	n	prop.	n	prop.	n	prop.	n	prop.	n	prop.	n	prop.
Overall																
Age 20	2040	0.24	904	0.08	1332	0.24	1227	0.11	1350	0.24	1174	0.16	1865	0.16	1433	0.09
Age 25	2040	0.67	433	0.34	1332	0.61	905	0.37	1350	0.76	875	0.65	1865	0.67	737	0.47
Age 28	2040	0.75	131	0.52	1332	0.72	423	0.54	1350	0.83	437	0.79	1865	0.77	737	0.56
< HS degree																
Age 20	903	0.34	275	0.21	632	0.31	396	0.21	202	0.32	138	0.23	344	0.31	138	0.27
Age 25	903	0.76	134	0.45	632	0.71	314	0.53	202	0.75	104	0.72	344	0.79	89	0.64
Age 28	903	0.81	51	0.57	632	0.80	168	0.66	202	0.85	56	0.80	344	0.85	89	0.69
HS graduates																
Age 20	770	0.23	423	0.04	471	0.16	675	0.06	689	0.26	711	0.17	726	0.18	382	0.13
Age 25	770	0.68	182	0.36	471	0.54	465	0.31	689	0.79	497	0.66	726	0.75	212	0.58
Age 28	770	0.74	47	0.51	471	0.69	193	0.48	689	0.86	240	0.78	726	0.82	212	0.65
College-educated																
Age 20	366	0.05	204	0.01	189	0.17	101	0.06	443	0.15	304	0.11	747	0.09	890	0.04
Age 25	366	0.47	115	0.22	189	0.44	83	0.19	443	0.72	258	0.62	747	0.56	415	0.39
Age 28	366	0.59	32	0.50	189	0.58	42	0.36	443	0.80	134	0.81	747	0.70	415	0.50

*For Norway, I used age 27 rather than age 28.
Note: proportions are weighted for the US and France because of the sampling designs

Table 3. Discrete-time Event History Models for First Marriages

	US whites		African-Americans		Italy		Spain		
Parameter	B	SE	B	SE	B	SE	B	SE	
Ages 15-19	-1.432	0.085 ***	-2.706	0.152 ***	-4.444	0.418 ***	-3.834	0.310	***
Ages 20-22	-0.346	0.074 ***	-1.870	0.122 ***	-1.989	0.197 ***	-1.726	0.156	***
Ages 26-28	-0.599	0.086 ***	-2.022	0.142 ***	-1.091	0.128 ***	-0.905	0.137	***
Ages 23-25	-0.919	0.107 ***	-2.362	0.181 ***	-1.551	0.169 ***	-0.994	0.184	***
Ages 29-31	-1.422	0.161 ***	-2.349	0.218 ***	-1.898	0.237 ***	-1.732	0.335	***
Ages 32-34	-2.182	0.200 ***	-2.778	0.254 ***	-2.603	0.287 ***	-2.730	0.512	***
Ages 35+	-0.549	0.076 ***	-1.794	0.118 ***	-1.136	0.133 ***	-0.861	0.117	***
< HS	-0.713	0.184 ***	-1.622	0.247 ***	0.155	0.142	0.135	0.117	
HS graduates	-0.243	0.093 **	-0.499	0.156 **	-0.014	0.140	0.144	0.150	
College [omitted]									
Ages 15-19*<HS	1.601	0.195 ***	1.822	0.284 ***	1.674	0.432 ***	0.980	0.318	**
Ages 15-19*HS grads	0.937	0.111 ***	0.875	0.203 ***	1.444	0.439 **	0.843	0.359	*
Ages 20-22*<HS	0.282	0.213	0.619	0.300 *	0.754	0.225 ***	0.396	0.181	*
Ages 20-22*HS grads	0.161	0.110	0.157	0.200	0.240	0.228	0.140	0.221	
Ages 26-28*<HS	-0.440	0.317	0.495	0.341	-0.411	0.198 *	-0.227	0.180	
Ages 26-28*HS grads	-0.016	0.151	-0.070	0.245	-0.142	0.190	-0.556	0.246	*
Ages 29-31*<HS	-0.005	0.367	-0.057	0.484	-0.609	0.267 *	-0.584	0.248	*
Ages 29-31*HS grads	0.151	0.197	0.051	0.308	-0.171	0.249	-1.401	0.398	***
Ages 32-34*<HS	0.201	0.524	-0.109	0.554	-1.010	0.387 **	-0.313	0.411	
Ages 32-34*<HS grads	0.119	0.309	0.087	0.361	-0.094	0.334	-0.242	0.503	
Ages 35+*<HS	1.271	0.585 *	0.781	0.484	-0.896	0.418 *	-0.310	0.589	
Ages 35+*HS grads	-0.435	0.501	-0.277	0.462	-0.415	0.417	-1.773	1.135	
Later cohort	-0.241	0.091 **	-0.315	0.170 +	-1.308	0.223 ***	-1.178	0.165	***
[Earlier cohort omitted]									
Later cohort*<HS	0.003	0.134	0.073	0.227	0.733	0.228 **	0.664	0.165	***
Later cohort*HS grads	0.235	0.091 **	0.060	0.174	0.277	0.225	0.170	0.197	
Ages 15-19*Later cohort	-0.538	0.118 ***	-0.480	0.212 *	-0.098	0.144	0.822	0.142	***
Ages 20-22*Later cohort	-0.172	0.110	-0.309	0.207	-0.162	0.119	0.223	0.131	+
Ages 26-28*Later cohort	-0.099	0.162	-0.017	0.273	0.265	0.155 +	0.472	0.176	**
Ages 29-31*Later cohort	-0.382	0.440	-1.071	1.026	-0.122	0.407	-0.251	0.533	
Currently in school	-0.990	0.045 ***	-0.636	0.092 ***	-1.119	0.079 ***	-1.163	0.092	***
Ever employed	-1.037	0.054 ***	-0.393	0.069 ***	-0.427	0.041 ***	-0.587	0.053	***
Events		4301		1116		3186		2644	
Person-years		47725		24577		49844		33975	
Deviance		26402		8717		20401		16258	

Table 3. Discrete-time Event History Models for First Marriages (cont.)

	France		West Germany		East Germany[a]		Norway[a]	
Parameter	B	SE	B	SE	B	SE	B	SE
Ages 15-19	-2.567	0.240 ***	-2.392	0.335 ***	-2.408	0.173 ***	-2.301	0.160 ***
Ages 20-22	-0.525	0.166 **	-1.063	0.232 ***	-0.185	0.124	-0.331	0.123 **
Ages 26-28	-0.576	0.203 **	-1.335	0.245 ***	-1.513	0.201 ***	-0.356	0.141 *
Ages 23-25	-1.533	0.317 ***	-1.792	0.299 ***	-2.718	0.375 ***	-1.091	0.190 ***
Ages 29-31	-1.326	0.330 ***	-2.445	0.467 ***	-2.671	0.463 ***	-1.409	0.286 ***
Ages 32-34	-2.475	0.466 ***	-3.255	1.015 **	-0.865	0.150 ***	-2.356	0.425 ***
Ages 35+	-0.144	0.168	-0.695	0.212 **			-0.123	0.125
< HS	-1.597	0.184 ***	-0.562	0.217 **	-0.103	0.209	-0.417	0.161 **
HS graduates	-1.459	0.183 ***	-0.239	0.210	-0.206	0.151	-0.134	0.111
College [omitted]								
Ages 15-19*<HS	2.314	0.265 ***	1.457	0.369 ***	0.561	0.256 *	1.263	0.209 ***
Ages 15-19*HS grads	2.181	0.273 ***	0.411	0.387	0.820	0.191 ***	0.783	0.167 ***
Ages 20-22*<HS	0.872	0.202 ***	0.710	0.279 *	-0.628	0.229 **	0.529	0.189 **
Ages 20-22*HS grads	0.933	0.202 ***	0.127	0.278	-0.138	0.158	0.312	0.133 *
Ages 26-28*<HS	-0.609	0.277 *	0.384	0.318	0.006	0.375	-0.229	0.283
Ages 26-28*HS grads	-0.412	0.270	0.282	0.307	-0.117	0.261	-0.159	0.187
Ages 29-31*<HS	-0.007	0.414	0.522	0.404	0.059	0.708	0.174	0.405
Ages 29-31*HS grads	0.172	0.407	0.435	0.391	0.743	0.441 +	0.048	0.291
Ages 32-34*<HS	-0.321	0.462	0.031	0.717	0.149	0.882	-0.344	0.671
Ages 32-34*<HS grads	-0.439	0.498	0.625	0.600	-0.480	0.758	-0.231	0.465
Ages 35+*<HS	-0.480	0.692	0.592	1.257	a	a	0.156	0.846
Ages 35+*HS grads	-0.075	0.655	1.274	1.153	a	a	0.801	0.564
Later cohort	-0.963	0.213 ***	-0.910	0.223 ***	-0.386	0.143 **	-0.482	0.114 ***
[Earlier cohort omitted]								
Later cohort*<HS	0.075	0.222	0.552	0.227 *	0.019	0.172	-0.027	0.157
Later cohort*HS grads	-0.058	0.221	0.158	0.227	-0.180	0.120	-0.039	0.115
Ages 15-19*Later cohort	-0.016	0.212	-0.314	0.186 +	0.035	0.162	0.171	0.158
Ages 20-22*Later cohort	-0.300	0.196	-0.131	0.158	-0.160	0.143	-0.239	0.132 +
Ages 26-28*Later cohort	0.810	0.274 **	0.020	0.207	0.176	0.243	-0.005	0.186
Ages 29-31*Later cohort	-0.074	1.028	-0.034	0.305	0.287	0.417	a	a
Currently in school	-1.447	0.100 ***	-1.413	0.091 ***	-1.003	0.077 ***	-1.254	0.064 ***
Ever employed	-0.465	0.071 ***	-0.616	0.094 ***	-0.395	0.075 ***	-1.077	0.100 ***
Events		1659		1267		1754		2253
Person-years		27960		23653		21055		33554
Deviance		11347		8706		10639		14003

[a] Coefficients could not be estimated for some cells because either the number of cases or the number of events was too small.

Table 4. Proportion of women who had a first birth by age, education, cohort, and country

Country	US whites				US blacks				Italy				Spain			
	Older		Younger		Older		Younger		Older		Younger		Older		Younger	
	n	prop	n	prop	n	prop	n	prop	n	prop	n	prop	n	prop	n	prop
Overall																
Age 20	3760	0.17	1814	0.14	1325	0.39	809	0.33	2883	0.11	1764	0.04	2337	0.08	1372	0.09
Age 25	3760	0.44	1021	0.40	1325	0.64	475	0.59	2883	0.46	1050	0.23	2249	0.47	811	0.32
Age 28	3760	0.59	472	0.51	1325	0.73	220	0.66	2883	0.65	539	0.42	2249	0.69	385	0.51
< HS degree																
Age 20	454	0.57	199	0.53	298	0.65	187	0.69	1550	0.17	583	0.10	1701	0.10	739	0.16
Age 25	454	0.80	110	0.83	298	0.81	103	0.87	1550	0.62	377	0.44	1654	0.54	454	0.49
Age 28	454	0.85	46	0.78	298	0.82	51	0.86	1550	0.80	209	0.60	1654	0.76	230	0.70
HS graduates																
Age 20	1343	0.19	569	0.19	481	0.44	299	0.35	998	0.04	1053	0.01	319	0.04	329	0.02
Age 25	1343	0.56	326	0.59	481	0.74	187	0.62	998	0.32	561	0.12	281	0.34	172	0.17
Age 28	1343	0.70	146	0.67	481	0.81	93	0.69	998	0.55	267	0.37	281	0.60	74	0.32
College-educated																
Age 20	1963	0.07	1046	0.04	546	0.22	323	0.15	334	0.02	128	0.00	317	0.02	304	0.00
Age 25	1963	0.28	585	0.20	546	0.48	185	0.42	334	0.11	112	0.01	314	0.20	185	0.05
Age 28	1963	0.45	280	0.37	546	0.61	76	0.52	334	0.28	63	0.03	314	0.41	81	0.14

Country	France				Germany - West				Germany - East				Norway			
cohort	Older		Younger		Older		Younger		Older		Younger		Older		Younger	
	n	prop	n	prop	n	prop	n	prop	n	prop	n	prop	n	prop	n	prop
Overall																
Age 20	2040	0.13	904	0.07	1332	0.10	1227	0.05	1350	0.16	1174	0.14	1865	0.13	1433	0.09
Age 25	2040	0.54	433	0.35	1332	0.35	905	0.25	1350	0.71	875	0.67	1865	0.55	737	0.44
Age 28	2040	0.71	131	0.48	1332	0.51	423	0.42	1350	0.82	437	0.83	1865	0.67	737	0.54
< HS degree																
Age 20	903	0.23	275	0.18	632	0.14	396	0.10	202	0.26	138	0.29	344	0.27	138	0.31
Age 25	903	0.69	134	0.61	632	0.48	314	0.40	202	0.73	104	0.71	344	0.78	89	0.76
Age 28	903	0.81	51	0.70	632	0.61	168	0.54	202	0.79	56	0.75	344	0.85	89	0.78
HS graduates																
Age 20	770	0.08	423	0.04	471	0.06	675	0.01	689	0.17	711	0.14	726	0.13	382	0.13
Age 25	770	0.53	182	0.39	471	0.24	465	0.18	689	0.75	497	0.71	726	0.64	212	0.63
Age 28	770	0.70	47	0.48	471	0.45	193	0.38	689	0.85	240	0.85	726	0.75	212	0.73
College-educated																
Age 20	366	0.01	204	0.00	189	0.03	101	0.01	443	0.09	304	0.07	747	0.06	890	0.04
Age 25	366	0.21	115	0.10	189	0.15	83	0.05	443	0.65	258	0.59	747	0.38	415	0.30
Age 28	366	0.49	32	0.25	189	0.30	42	0.14	443	0.81	134	0.83	747	0.54	415	0.42

*For Norway, I used age 27 rather than age 28.

Note: proportions are weighted for the US and France because of the sampling designs

Table 5. Discrete-time Event History Models for First Births

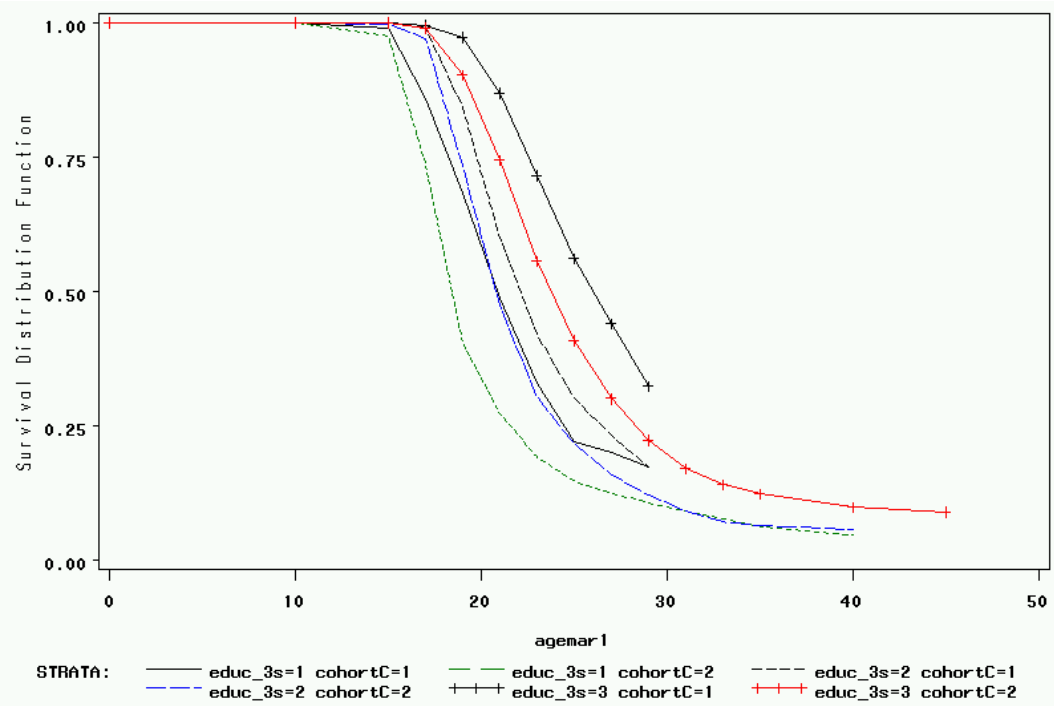
	US whites		African-Americans		Italy		Spain	
Parameter	B	SE	B	SE	B	SE	B	SE
Ages 15-19	-0.608	0.111 ***	-0.332	0.128 **	-4.344	0.513 ***	-3.946	0.382 ***
Ages 20-22	0.083	0.095	0.330	0.133 *	-2.407	0.274 ***	-2.360	0.220 ***
Ages 26-28	0.422	0.089 ***	0.569	0.143 ***	-1.276	0.128 ***	-1.198	0.136 ***
Ages 23-25	0.168	0.088 +	0.249	0.136 +	-2.183	0.208 ***	-1.544	0.143 ***
Ages 29-31	0.469	0.095 ***	-0.010	0.198	-1.424	0.145 ***	-0.808	0.146 ***
Ages 32-34	0.200	0.116 +	-0.230	0.264	-1.507	0.183 ***	-1.121	0.229 ***
Ages 35+	-0.567	0.139 ***	-0.959	0.332 **	-2.140	0.210 ***	-2.078	0.346 ***
< HS	0.059	0.176	-0.848	0.292 **	1.122	0.212 ***	0.691	0.144 ***
HS graduates	0.379	0.084 ***	0.012	0.165	0.519	0.215 *	0.440	0.177 *
College [omitted]								
Ages 15-19*<HS	0.265	0.204	0.903	0.308 **	0.357	0.546	0.070	0.396
Ages 15-19*HS grads	-0.078	0.127	0.045	0.192	0.302	0.560	0.117	0.461
Ages 20-22*<HS	0.272	0.216	0.675	0.341 *	-0.153	0.331	0.094	0.253
Ages 20-22*HS grads	-0.030	0.113	0.046	0.205	-0.386	0.338	-0.124	0.302
Ages 26-28*<HS	-0.642	0.292 +	-1.020	0.509 *	-1.024	0.249 ***	-0.237	0.195
Ages 26-28*HS grads	-0.511	0.130 ***	-0.238	0.256	-0.555	0.251 *	-0.235	0.247
Ages 29-31*<HS	-1.097	0.369 **	-1.455	0.804 +	-1.246	0.275 ***	-0.786	0.216 ***
Ages 29-31*HS grads	-0.627	0.154 ***	0.153	0.334	-0.501	0.270 +	-0.928	0.295 **
Ages 32-34*<HS	-1.699	0.569 **	-0.699	0.831	-1.938	0.340 ***	-1.181	0.315 ***
Ages 32-34*<HS grads	-0.956	0.217 ***	0.039	0.458	-0.501	0.308	-1.637	0.505 **
Ages 35+*<HS	-3.011	1.034 **	-0.320	0.845	-2.568	0.389 ***	-1.333	0.433 **
Ages 35+*HS grads	-1.309	0.303 ***	-0.958	0.798	-1.732	0.402 ***	-0.773	0.545
Later cohort	-0.223	0.104 *	-0.118	0.182	-2.224	0.384 ***	-1.475	0.224 ***
[Earlier cohort omitted]								
Later cohort*<HS	0.299	0.151 *	0.125	0.182	1.560	0.381 ***	0.879	0.217 ***
Later cohort*HS grads	0.304	0.104 **	0.129	0.148	1.089	0.380 **	0.196	0.257
Ages 15-19*Later cohort	-0.086	0.137	0.034	0.198	0.129	0.172	1.229	0.164 ***
Ages 20-22*Later cohort	0.178	0.125	0.271	0.209	-0.230	0.142	0.494	0.148 ***
Ages 26-28*Later cohort	0.086	0.155	-0.718	0.334 *	0.262	0.156 +	0.329	0.174 +
Ages 29-31*Later cohort	0.258	0.315	-0.297	0.639	0.702	0.252 **	0.613	0.316 +
Currently in school	-1.600	0.061 ***	-1.170	0.081 ***	-1.223	0.103 ***	-1.368	0.122 ***
Ever employed	-2.530	0.067 ***	-2.406	0.080 ***	-0.669	0.043 ***	-0.833	0.054 ***
Events		3698		1560		2881		2434
Person-years		61495		17412		53004		38983
Deviance		24001		8924		19271		15654

Table 5. Discrete-time Event History Models for First Births (cont.)

	France			West Germany			East Germany[a]			Norway[a]		
Parameter	B	SE		B	SE		B	SE		B	SE	
Ages 15-19	-3.324	0.375	***	-1.939	0.416	***	-1.779	0.183	***	-1.052	0.170	***
Ages 20-22	-1.249	0.213	***	-1.995	0.410	***	0.201	0.131		0.171	0.136	
Ages 26-28	0.475	0.173	**	-0.905	0.214	***	-0.258	0.181		0.713	0.137	***
Ages 23-25	0.000	0.169		-0.989	0.235	***	0.397	0.132	**	0.538	0.133	***
Ages 29-31	0.111	0.215		-0.953	0.230	***	-1.078	0.311	***	0.445	0.159	**
Ages 32-34	0.256	0.244		-1.607	0.355	***	-1.308	0.400	**	0.323	0.210	
Ages 35+	-0.659	0.302	*	-1.778	0.520	***	-2.948	1.011	**	-0.522	0.306	+
< HS	-0.677	0.175	***	-0.054	0.235		-0.872	0.197	***	0.001	0.159	
HS graduates	-0.699	0.172	***	-0.160	0.237		-0.477	0.128	***	0.033	0.106	
College [omitted]												
Ages 15-19*<HS	2.107	0.384	***	0.451	0.450		1.510	0.252	***	0.458	0.216	*
Ages 15-19*HS grads	1.710	0.396	***	0.138	0.476		1.076	0.186	***	0.254	0.175	
Ages 20-22*<HS	1.082	0.225	***	1.051	0.443	*	0.196	0.224		0.656	0.191	***
Ages 20-22*HS grads	0.959	0.226	***	0.616	0.451		0.292	0.140	*	0.320	0.136	*
Ages 26-28*<HS	-0.981	0.213	***	-0.021	0.293		-0.037	0.344		-0.193	0.256	
Ages 26-28*HS grads	-0.520	0.198	**	0.228	0.290		0.220	0.216		-0.205	0.160	
Ages 29-31*<HS	-0.499	0.270		-0.176	0.336		0.946	0.494	+	-0.585	0.413	
Ages 29-31*HS grads	-0.346	0.264		0.387	0.325		0.657	0.382	+	-0.353	0.231	
Ages 32-34*<HS	-1.035	0.345	**	-0.229	0.504		a	a		-0.913	0.576	
Ages 32-34*<HS grads	-0.551	0.319	+	0.050	0.505		-0.080	0.616		-0.901	0.364	*
Ages 35+*<HS	-1.330	0.445	**	-1.318	0.810		1.463	1.443		-1.747	1.058	+
Ages 35+*HS grads	-0.744	0.418	+	-0.384	0.758		1.001	1.243		-0.449	0.458	
Later cohort	-0.453	0.193	*	-0.288	0.238		-0.252	0.122	*	-0.098	0.113	
[Earlier cohort omitted]												
Later cohort*<HS	0.647	0.205	**	0.339	0.239		0.213	0.170		0.183	0.153	
Later cohort*HS grads	0.369	0.200	+	0.076	0.239		-0.011	0.117		0.331	0.115	**
Ages 15-19*Later cohort	-0.266	0.180		-0.667	0.217	**	0.153	0.156		-0.071	0.158	
Ages 20-22*Later cohort	-0.182	0.150		-0.221	0.172		0.049	0.129		-0.307	0.132	*
Ages 26-28*Later cohort	0.265	0.199		-0.049	0.179		0.229	0.203		0.062	0.161	
Ages 29-31*Later cohort	0.261	0.506		-0.160	0.237		-0.469	0.402		a	a	
Currently in school	-1.369	0.108	***	-1.964	0.123	***	-1.462	0.078	***	-2.040	0.083	***
Ever employed	-1.000	0.067	***	-1.279	0.093	***	-1.227	0.078	***	-2.114	0.107	***
Events		2090			1204			1973			2323	
Person-years		27686			28285			22072			35550	
Deviance		13056			8627			11343			13935	

[a] Coefficients could not be estimated for some cells because either the number of cases or the number of events was too small.

Figure 1a. Transition to First Marriage: proportion of US white women unmarried by age, education, and cohort



Notes: The longer colored lines refer to the earlier cohort (those born before 1965), while the shorter, black lines represent the later cohort. On the right side of the graph are the lines representing college-educated women (the red line and the black line with + signs) – the gap between the two lines indicates that fewer college-educated women in the later cohort have married at each age under 30 years. There is a similar delay evident for women without high school degrees (green dashed line and straight black line), and for high school graduates (blue-dashed line and black dashed line).

Figure 1b. Transition to First Marriage: proportion of African-American woman unmarried by age, education, and cohort

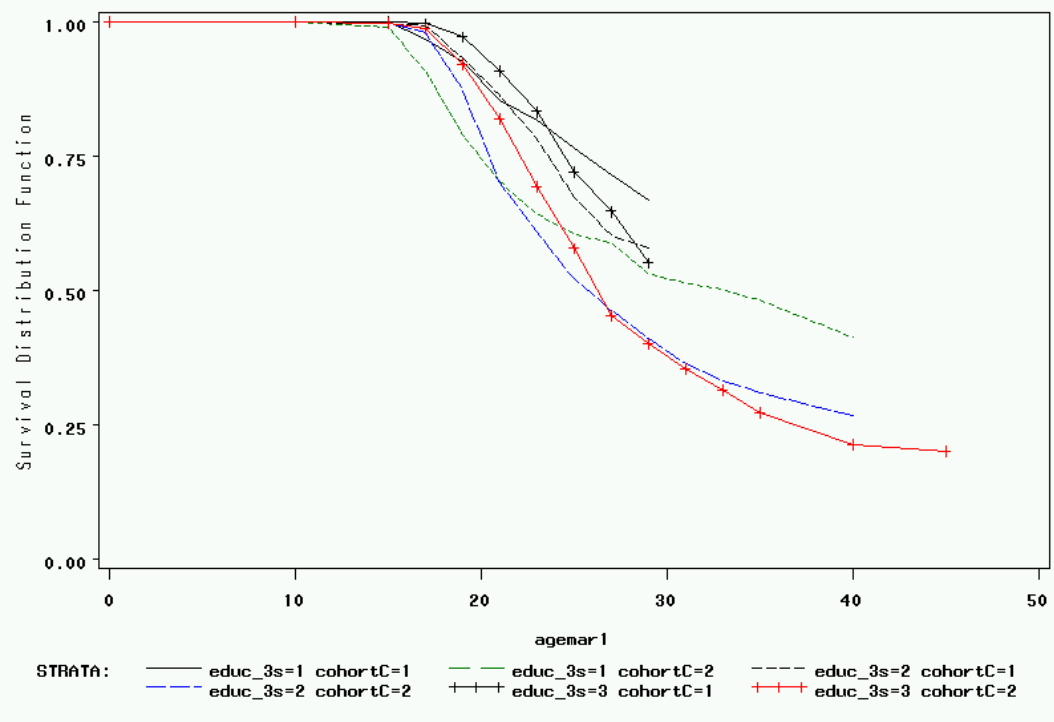


Figure 1c. Transition to First Marriage: proportion of Italian woman unmarried by age, education, and cohort

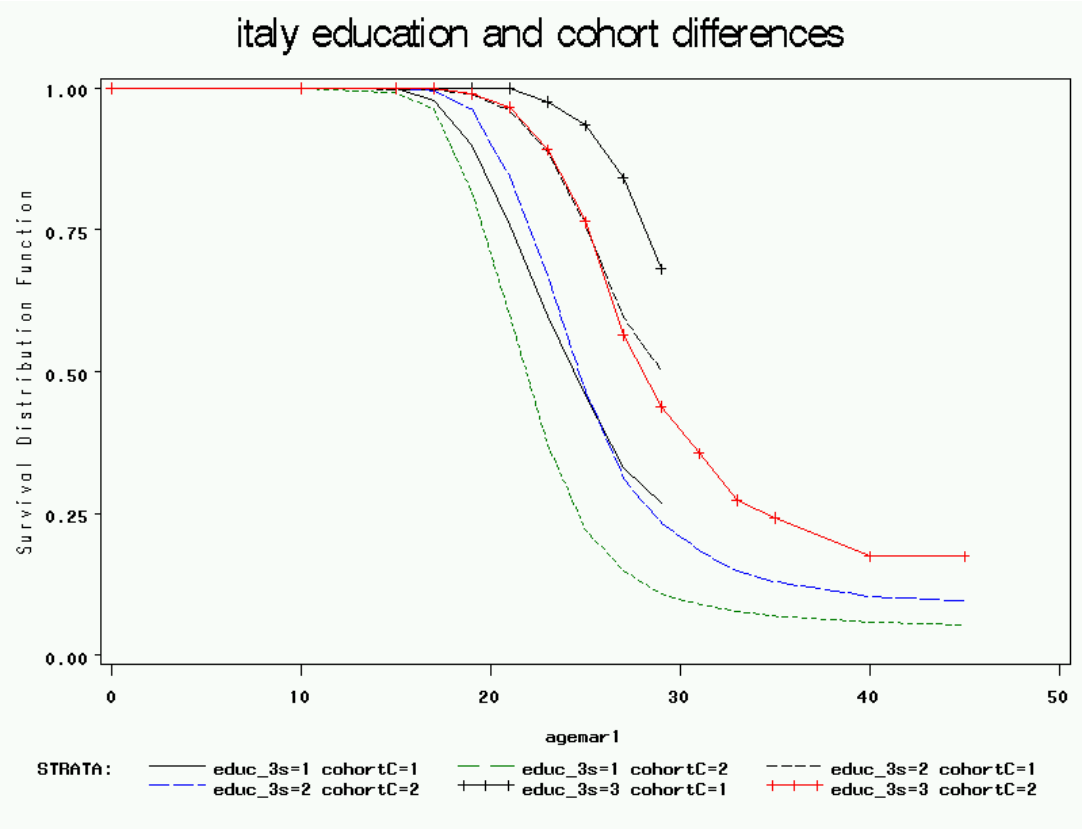


Figure 1d. Transition to First Marriage: proportion of Spanish woman unmarried by age, education, and cohort

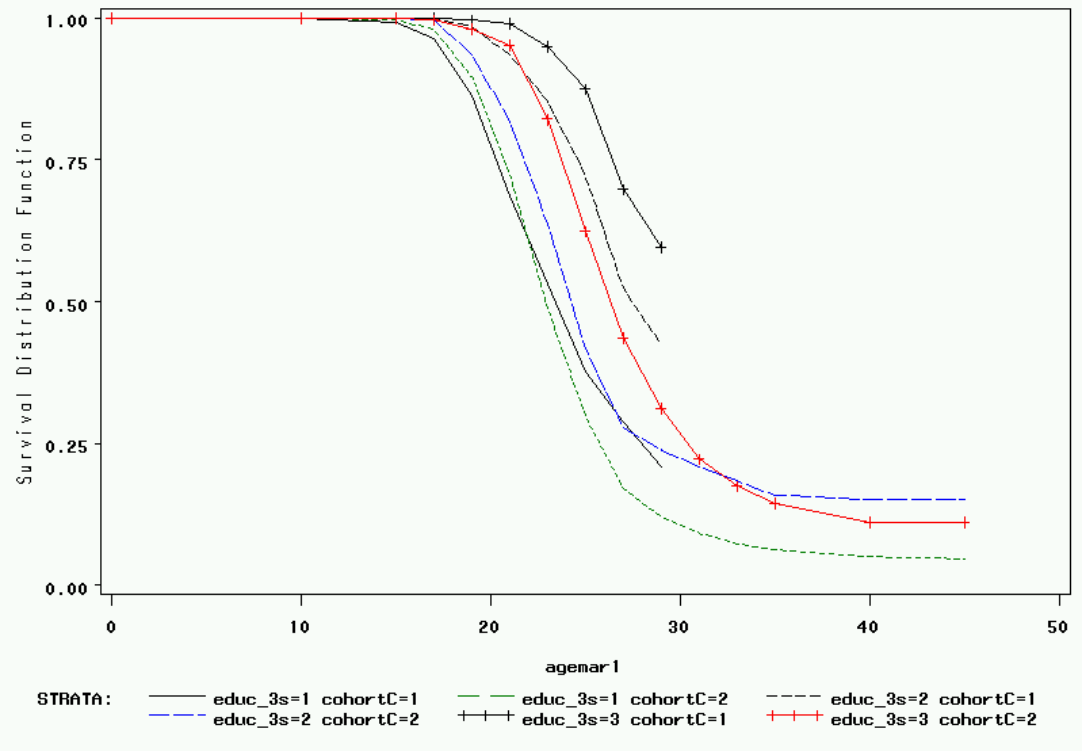


Figure 1e. Transition to First Marriage: proportion of French woman unmarried by age, education, and cohort

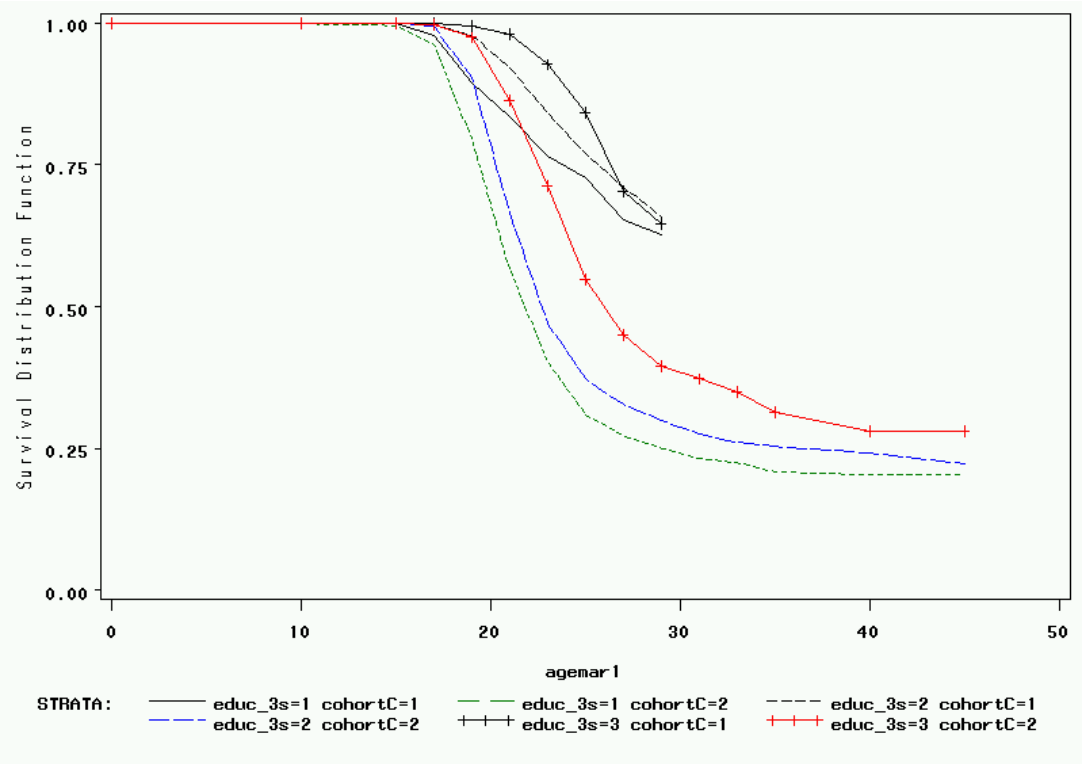


Figure 1f. Transition to First Marriage: proportion of West German woman unmarried by age, education, and cohort

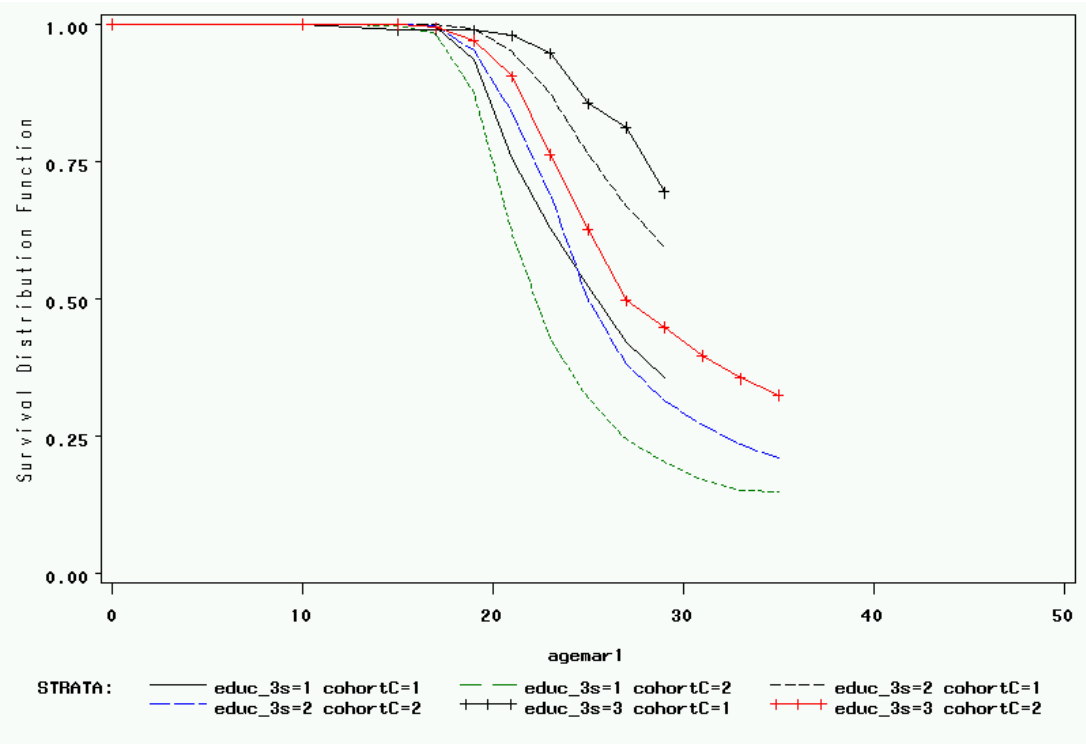


Figure 1g. Transition to First Marriage: proportion of East German woman unmarried by age, education, and cohort

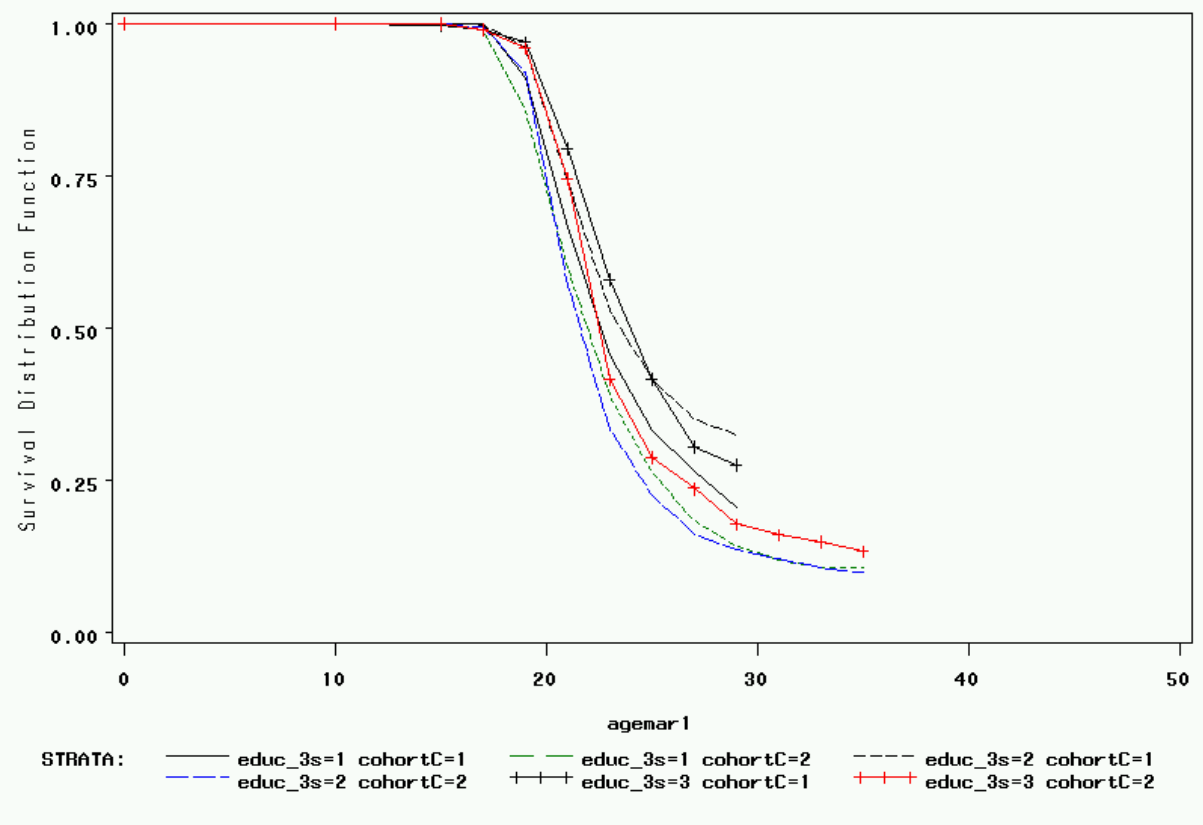


Figure 1h. Transition to First Marriage: proportion of Norwegian woman unmarried by age, education, and cohort

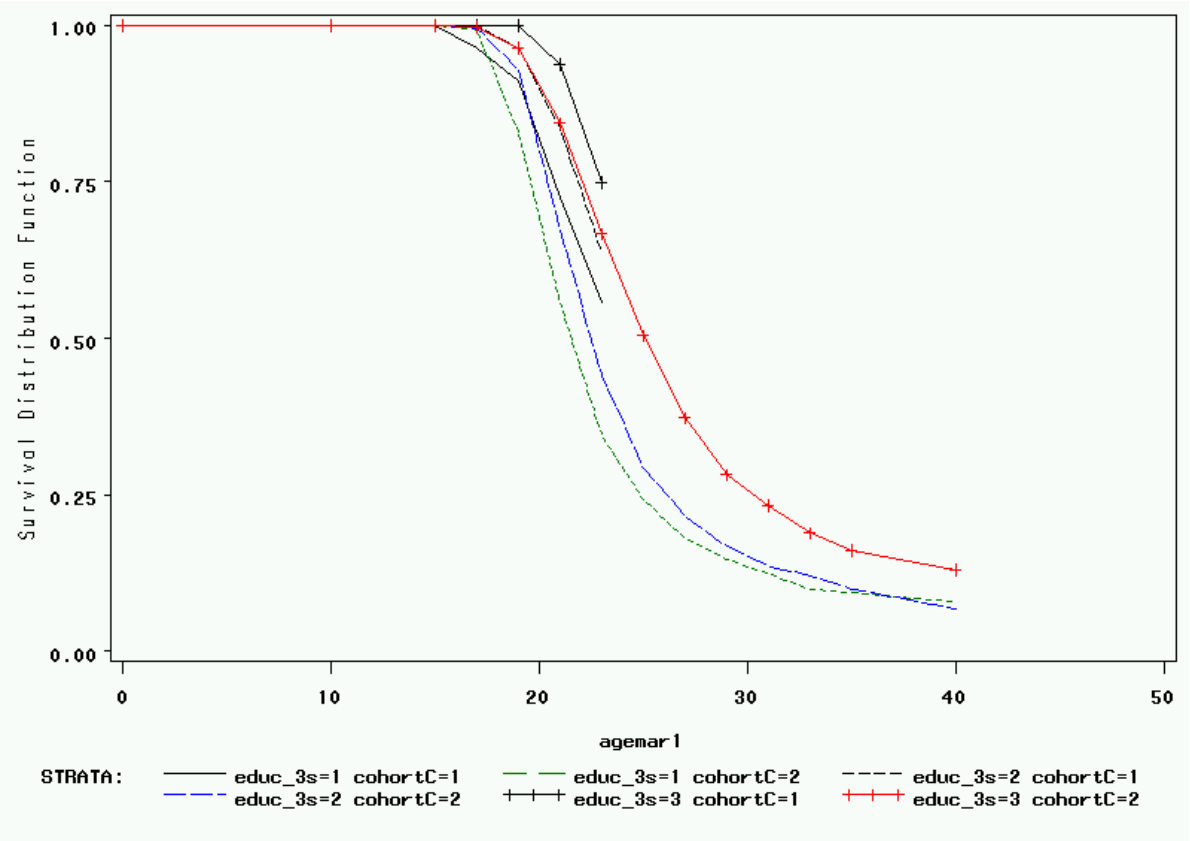
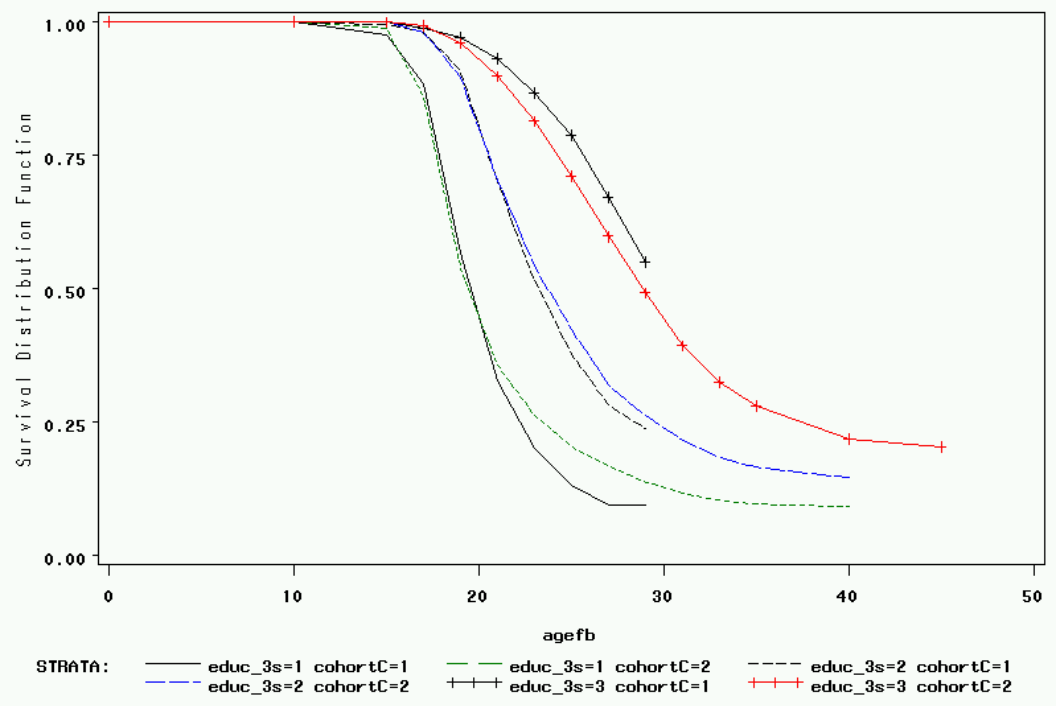


Figure 2a. Transition to First Birth: proportion of US white women unmarried by age, education, and cohort



Notes: The longer colored lines refer to the earlier cohort (those born before 1965), while the shorter, black lines represent the later cohort. On the right side of the graph are the lines representing college-educated women (the red line and the black line with + signs) – the gap between the two lines indicates that fewer college-educated women in the later cohort have married at each age under 30 years. There is a similar delay evident for women without high school degrees (green dashed line and straight black line), and for high school graduates (blue-dashed line and black dashed line).

Figure 2b. Transition to First Birth: proportion of African-American women unmarried by age, education, and cohort

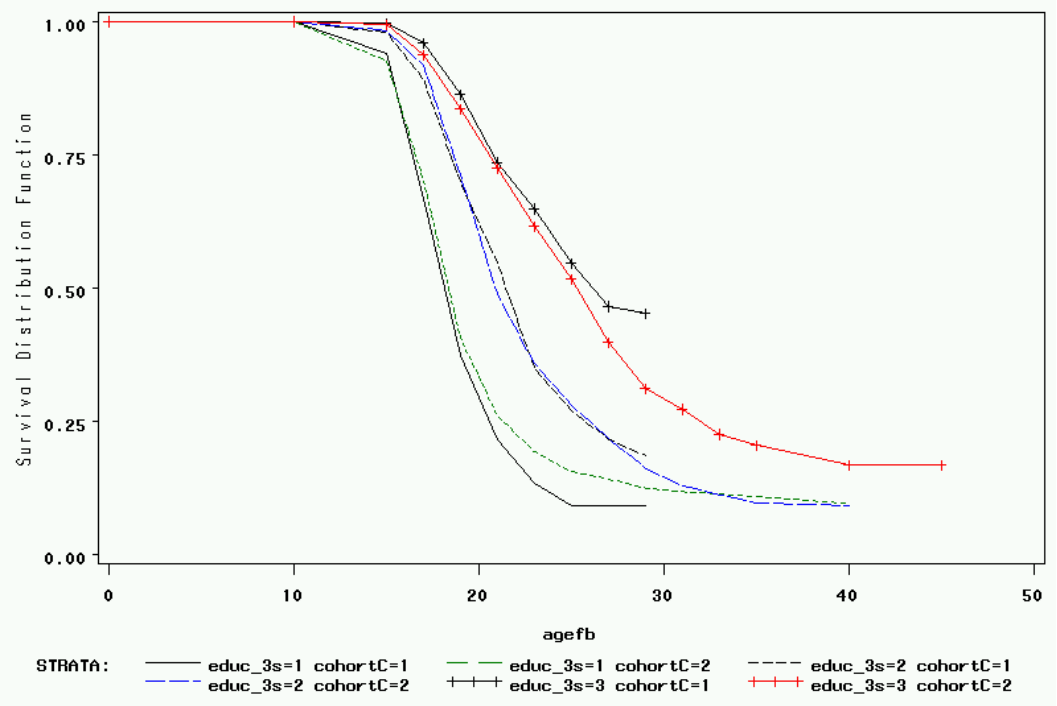


Figure 2c. Transition to First Birth: proportion of Italian women unmarried by age, education, and cohort

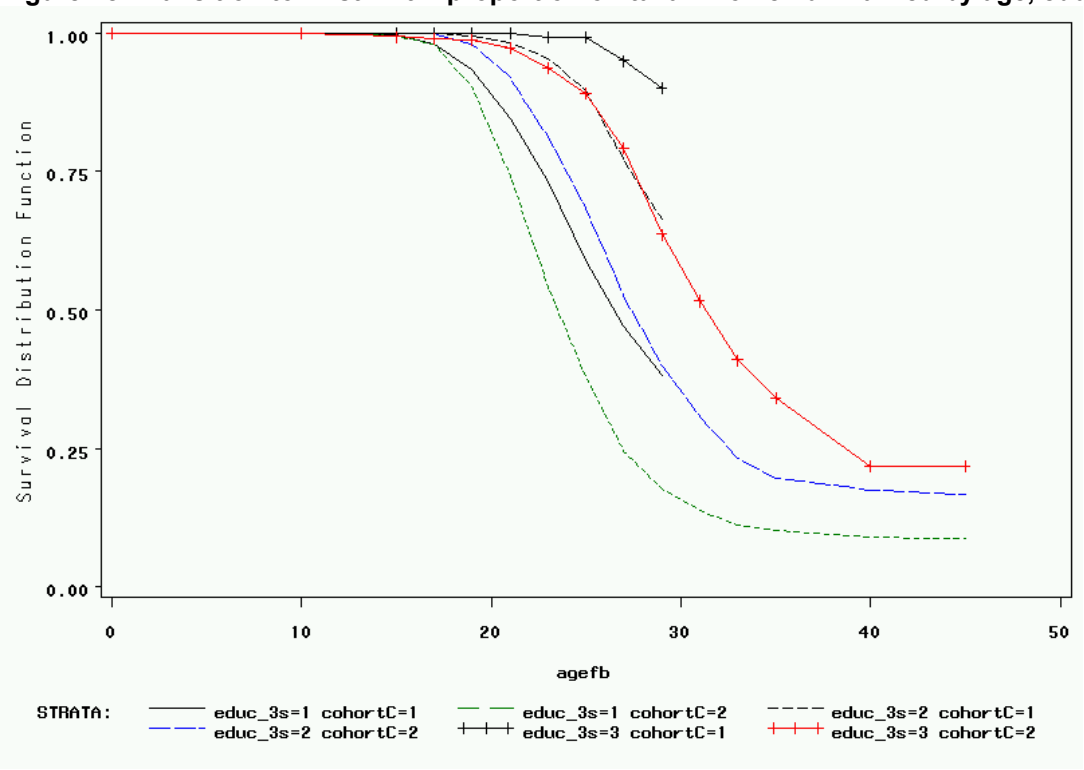


Figure 2d. Transition to First Birth: proportion of Spanish women unmarried by age, education, and cohort

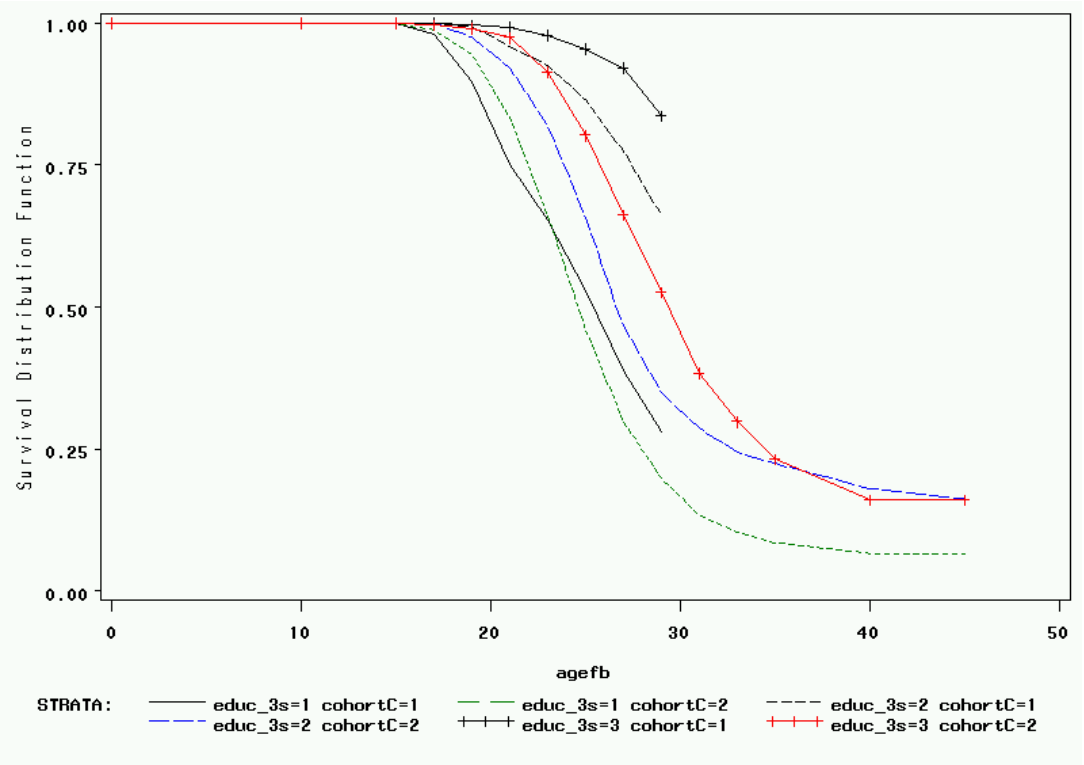


Figure 2e. Transition to First Birth: proportion of French women unmarried by age, education, and cohort

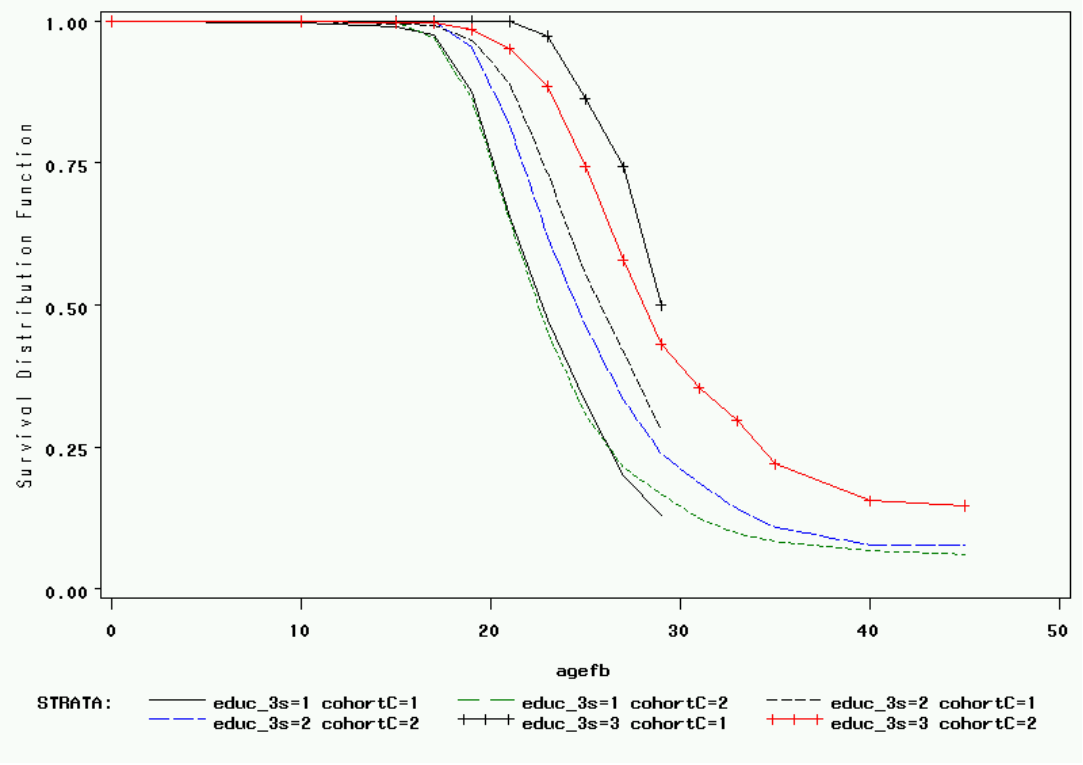


Figure 2f. Transition to First Birth: proportion of West German women unmarried by age, education, and cohort

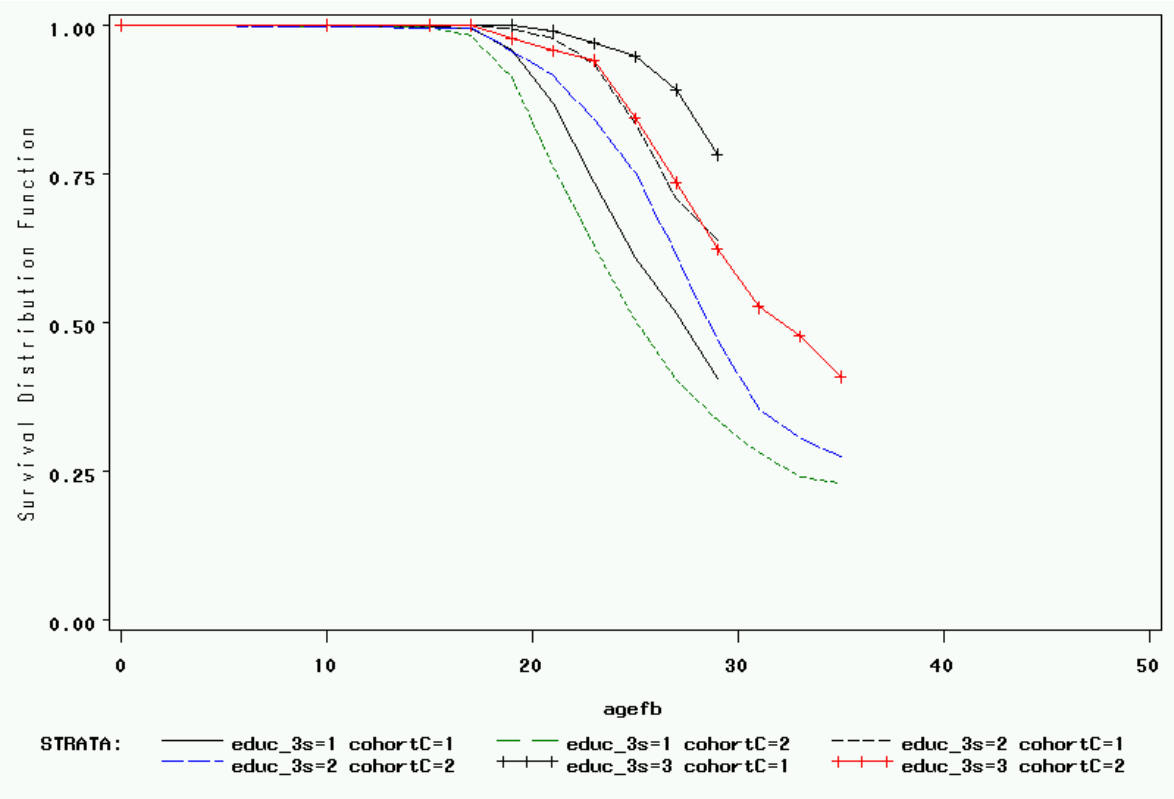


Figure 2g. Transition to First Birth: proportion of East German women unmarried by age, education, and cohort

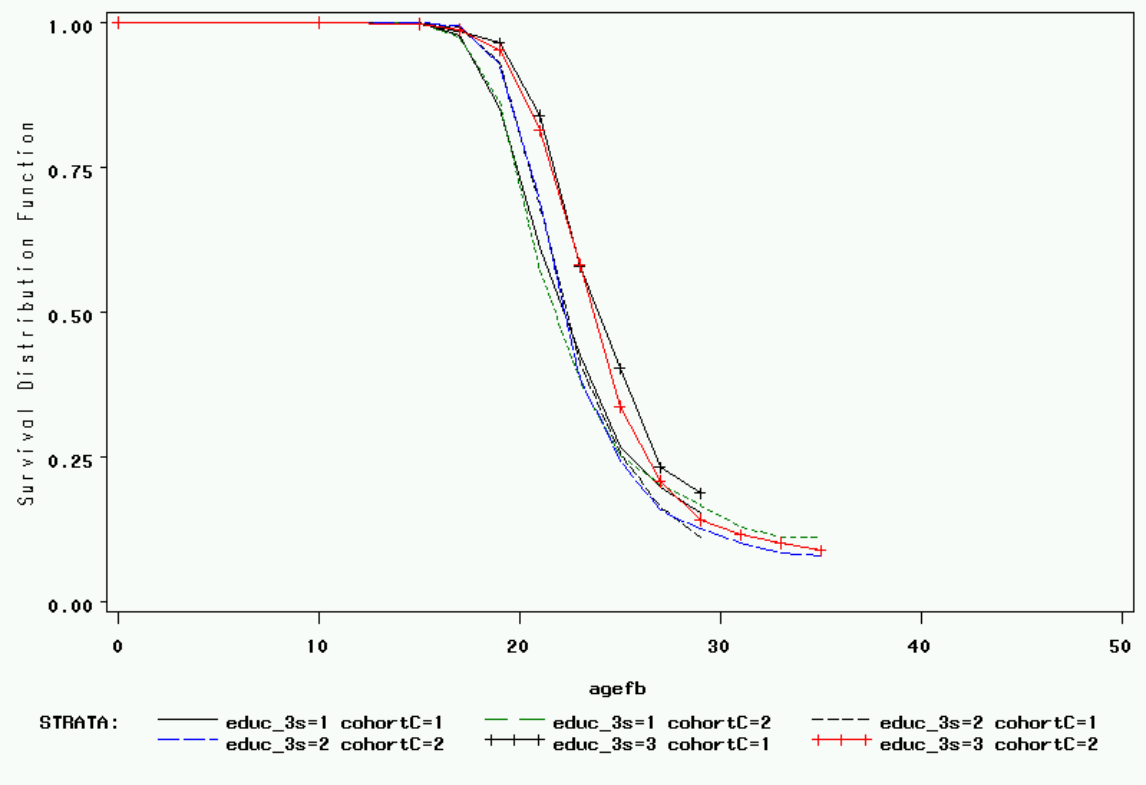


Figure 2g. Transition to First Birth: proportion of Norwegian women unmarried by age, education, and cohort