Pathways to First Birth and the Changing Role of Education in Europe and the United States

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Abstract

This paper applies multistate event history models to study the changing influence of educational attainment on six pathways to first birth for women born between 1950 and 1979 using harmonised retrospective union and fertility histories from 13 European countries and the United States. We find that when controlling for educational enrolment and birth cohort, having a first birth while being unpartnered (both never partnered and unpartnered after a union dissolution) or within cohabitation is associated with low education. Additionally, a first birth within marriage that was preceded by cohabitation and after re-partnering is primarily experienced by more educated women. When comparing the strength of the influence of education across these pathways, the influence of educational attainment is stronger on the transition to first birth within cohabitation and after re-partnering than on partnership transitions while this is the other way around for the pathways leading to a marital first birth.

Introduction

Union and family formation behaviours have changed considerably in the last few decades in Europe and the US; for example, first marriages are being delayed (Kiernan, 2004), nonmarital cohabitation has replaced marriage as the first form of union (Berrington, 2003; Bumpass & Lu, 2000), and the proportion of extramarital births has increased (Perelli-Harris, Sigle-Rushton, et al., 2010; Seltzer, 2004). Additionally, unions have become more unstable, as indicated by the large share of marriages ending with divorce (Amato & James, 2010). As a consequence, the traditional sequence of family life events has become less prevalent and family life courses have become more diverse and less predictable (Liefbroer, 1999).

These changes generated a significant interest among family demographers across Europe and the United States. Research aimed at examining whether these new types of family behaviours are associated with certain educational groups (used as a proxy for socio-economic status) in the society. If this is the case, family formation behaviours might contribute substantially to the reproduction of social inequalities through people's family life experiences.

Previous research examined the role of education on partnership status at first birth (Perelli-Harris & Gerber, 2011; Perelli-Harris, Sigle-Rushton, et al., 2010), on first partnership formation (Berrington & Diamond, 2000; Wiik, 2011) on the transition from childless cohabitation to separation or marriage (Berrington, 2001) as well as to first birth (Berrington, 2003), and the risk of a divorce (Berrington & Diamond, 2000; Lyngstad & Jalovaara, 2010; Poortman & Kalmijn, 2002; Vignoli & Ferro, 2009). Only a few studies investigated the effect of education on the transition to first birth after divorce or union dissolution. Finally, most literature on fertility after divorce has studied the risk of a higher order birth rather than the risk of a first birth within higher order unions (Prskawetz, Vikat,

Philipov, & Engelhardt, 2003; Thomson, Winkler-Dworak, Spielauer, & Prskawetz, 2012; Vikat, Thomson, & Hoem, 1999).

Although these studies showed that educational attainment plays an important role in partnership and family formation, they typically focused on one specific segment of the family life course and examined one transition or a set of competing transitions. These approaches did not account for the possible interdependence between earlier and later family life course events, as suggested by life course theory (Elder, 1975). Some studies explicitly modelled this interdependence using simultaneous hazard equations (e.g. Brien, Lillard, & Waite, 1999; Lillard & Waite, 1993; Steele, Kallis, Goldstein, & Joshi, 2005).

This study takes a life course perspective by examining the influence of educational attainment on each consecutive partnership and parenthood transition in the early family life course which together form possible pathways to a first birth. More specifically, I examine the changing role of educational attainment across women's early family life course in Europe and the United States by addressing the following research questions: How does educational attainment influence the pathways to first birth in Europe and the United States? Does the role of educational attainment change over the early family life course? And does it play a more important role for some transitions than for some others? Are there differences across countries? These questions are answered by studying six possible pathways to first birth: (1) while being never partnered, (2) within nonmarital cohabitation, (3) within marriage that was preceded by cohabitation, (4) within direct marriage, (5) after union dissolution, and (6) following repartnering after union dissolution.

To answer the research questions, multistate event history models are applied. These models are widely used in biomedical sciences (e.g. Al Mamun, 2003; Beyersmann, Schumacher, & Allignol, 2012; de Wreede, Fiocco, & Putter, 2011; Putter, 2011a; Putter, 2011b; Putter, van der Hage, de Bock, Elgalta, & van de Velde, 2006) but their application in

demography is limited (Bonetti, Piccarreta, & Salford, 2013). Using this innovative approach not only allows for exploring the influence of education on each and every partnership and parenthood transition within the same model but also to directly compare the coefficients across transitions. This allows for (1) examining the influence of educational attainment on each pathway to first birth and (2) comparing the role of education across the family life course and establishing whether the influence of education is more important for some transitions than for some others.

Background and Theory

Several possible partnership pathways can lead to a first birth. Women can experience a first birth (1) while being never partnered, (2) within nonmarital cohabitation, (3) within marriage that was preceded by cohabitation, (4) within direct marriage, (5) following union dissolution, and (6) within a new partnership that was formed after the dissolution of a previous union. Pathways 2 to 6 are the outcomes of several consecutive transitions. For example, the transition to first birth within marriage that was preceded by cohabitation includes the transition from being never partnered to cohabitation, from cohabitation to marrying the same partner and finally, the transition to a marital first birth.

Rather than examining the changing role of educational attainment over the possible pathways to first birth, previous research typically focused on its influence on one element or a set of competing elements of these pathways. Additionally, studies vary in their definition of education. Therefore, after elaborating on the different dimensions and definitions of education, the following sections review the theoretical arguments and previous findings relating to the impact of educational attainment on each element or a set of competing elements of these pathways. These arguments and the empirical evidence are, then, combined to understand their implications for studying pathways to first birth.

Educational Attainment and Enrolment

The influence of education has two components: educational attainment and enrolment. Previous studies vary in the way they measure educational attainment. For example, Aassve (2003) used the continuous measure of the Armed Forced Qualification Test (AQFT) where higher values meant higher educational level. Other studies used the number of years of education (e.g. Berrington, 2001), a categorical variable with values low, medium, and high education (e.g. Billari & Philipov, 2004a; Perelli-Harris & Gerber, 2011; Perelli-Harris, Sigle-Rushton, et al., 2010), or the age at first completing continuous education (Ni Bhrolchain & Beaujouan, 2013).

Additionally, it is not only the level of education that is important when examining the influence of education on partnership and parenthood transitions but also whether or not women were enrolled in full-time education. First, there is a conflict between the role of a student and the role of a mother. Additionally, there are some normative expectations in the society that young women who are at school do not enter marriage but that they first finish education before taking on the responsibilities of marriage and family formation (Blossfeld & Huinink, 1991; Thornton, Axinn, & Teachman, 1995). Therefore, women who are enrolled in school are less likely to become mothers and to form a first marital or co-residential union than those who already left school (Kravdal, 1994; Rindfuss, Morgan, & Swicegood, 1988). This paper focuses on the influence of educational attainment net of the influence of educational enrolment.

Transition to First Union

Several theoretical arguments aim to explain how educational attainment influences whether a never partnered women enters cohabitation or marriage as a first union. First, according to search theory (Brien, Lillard, & Stern, 2006), single individuals are searching for an

appropriate spouse in the marriage market where individuals with higher personal earnings have better marriage prospects (Aassve, 2003; Lichter & Qian, 2008). As more educated women usually have higher earnings, they are more attractive in the marriage market. This is in line with Oppenheimer's (1997, 2000) argument that women's increased labour force participation provides access to more attractive partners and thus it increases women's desirability as potential partners. Also, the accumulation of school experience enlarges the possibilities for employment and, via higher earnings, it leads to a better financial ability to marry (Thornton et al., 1995). These arguments predict higher educated women to be more likely to get married (and thus less likely to cohabit) once the effect of educational enrolment is accounted for.

However, higher educated women might be more aware of their attractiveness in the marriage market and therefore become more selective in their decisions. This may decrease their marriage probabilities (Aassve, 2003). This is in line with the argument that as women become economically more independent, due to their increased labour force participation and earnings, they have less to gain from marrying (Becker, 1981). This is especially true for higher educated women who usually have higher earnings and are thus more economically independent. Consequently, higher educated women are expected to be less likely to marry (and thus more likely to cohabit or remain single) than their lower educated counterparts. It is important to mention that these arguments do not specifically distinguish between the transition to direct marriage and to marriage that was preceded by cohabitation.

Second, the Second Demographic Transition Theory (SDT) suggests that it is the higher educated, more liberal, more egalitarian and more individualistic women who would be the forerunners of 'new' demographic behaviours such as nonmarital cohabitation (Lesthaeghe & van de Kaa, 1986). Thus, highly educated women are argued to be more likely to cohabit and less likely to marry than lower educated women.

Previous research studied the antecedents of the transition to first union formation in different ways and settings. Most studies examined the relationship between education and entry into first union without differentiating between entry into cohabitation and marriage and found that higher education was associated with a lower rate of entry into first union in Europe (Aassve, Burgess, Propper, & Dickson, 2006; Billari & Philipov, 2004b; Liefbroer & Corijn, 1999) and the US (Aassve et al., 2006; Billari & Philipov, 2004b; Liefbroer & Corijn, 1999). Studies that investigated the entry into either cohabitation or marriage showed that higher educated women were less likely to enter marriage in the US (Aassve, 2003) and in Spain (Baizán, Aassve, & Billari, 2003; Dominguez-Folgueras & Castro-Martin, 2013) and more likely to enter cohabitation in Norway (Wiik, 2011). Education did not have a significant influence on the transition to first cohabitation in Spain (Baizán et al., 2003).

Transition from Premarital Cohabitation to Marriage

As mentioned earlier, the available theoretical arguments in the literature that link women's educational attainment to their marriage prospects fail to address the possible differences between the transition from being never partnered to direct marriage and the transition to marriage via premarital cohabitation (of childless women who are not pregnant). Thus, this paper speculates about the relationship between educational attainment and the possible outcomes of cohabiting relationships. On the one hand, more educated women have more resources and therefore more favourable marriage prospects than lower educated women from poorer social backgrounds (Lichter & Qian, 2008; Lichter, Qian, & Mellott, 2006). Furthermore, lower educated women might cohabit with partners who have fewer resources themselves and thus are less attractive marriage partners (Upchurch, Lillard, & Panis, 2002). If this is the case, lower educated women are expected to remain within cohabitation and higher educated women are expected to have higher marriage risks.

Most previous research focused on the transition from cohabitation to marriage and found that education did not influence cohabiting women's marriage risks in the US (Lichter et al., 2006). Only a few studies investigated the competing transitions from cohabitation to either marriage or divorce. For example, Berrington (2001) found that the level of education did not have a significant influence on cohabiting women's entry rate into marriage or into separation in Britain for women born in 1958 when controlling for other factors, such as age at first marriage.

Transition to a Single, Cohabiting or Marital First Birth

Women can experience a first birth while being never partnered, within cohabitation, or within marriage. As mentioned in the previous section, the SDT argues that higher educated, more liberal and more individualistic women are more likely to experience 'new' types of family behaviours such as nonmarital cohabitation or nonmarital childbearing (Lesthaeghe & Surkyn, 2002). Following from this, more educated women are expected to have higher nonmarital first birth risks and lower marital first birth risks than women with lower education.

On the contrary, the Pattern of Disadvantage (POD) argument proposes that it is rather the more disadvantaged groups in the society (i.e. those with low education and fewer resources) who are more likely to experience these 'new' types of demographic behaviours (Hobcraft & Kiernan, 2001; Perelli-Harris & Gerber, 2011; Perelli-Harris, Sigle-Rushton, et al., 2010). Also, Upchurch et al. (2002) suggest that nonmarital childbearing is a more common strategy among economically disadvantaged women because the economic benefits of a potential marriage provided by the father are few. In other words, lower educated women are argued to be more likely to bear a child within cohabitation or while being single and less likely to have a first child within marriage than higher educated women.

Previous studies found consistent results; higher education was associated with a lower rate of entry into nonmarital first birth in the US (Aassve, 2003; Upchurch et al., 2002), the UK (Berrington, 2001, 2003; Steele, Joshi, Kallis, & Goldstein, 2006), and in many European countries (Perelli-Harris & Gerber, 2011; Perelli-Harris, Sigle-Rushton, et al., 2010). However, previous work did not differentiate between the transition rates to a first marital birth from direct marriage or a marriage that was preceded by cohabitation.

Transition to First Birth after Union Dissolution or Repartnering

Women who experienced a union dissolution (i.e. the dissolution of a cohabiting or a marital union) might either find a new partner with whom they have a first baby or they might experience a first birth outside of a coresidential union. One could argue that having a first birth following union dissolution and without having formed a new partnership is similar to the experience of a single first birth. Thus, it may be that lower educated, more disadvantaged women are more likely to experience such a transition. On the contrary, some studies argued that women who were once attractive in the marriage market (i.e. higher educated women) probably have more favourable characteristics and thus they are more likely to get married again (Upchurch et al., 2002). If more educated women select themselves into repartnering, they might also be more likely to experience a first birth within such a union compared to lower educated women.

Literature on the transition to first birth following union dissolution is scarce as most studies focused on the formation of new families where at least one child is present from a previous union (Prskawetz et al., 2003; Thomson, 2004; Thomson et al., 2012) rather than examining the occurrence of a first birth within higher order unions or after union dissolution but without having formed a new partnership.

Educational Attainment and Pathways to First Birth

Table 1 summarises the expectations of the above theoretical arguments for each element of the six examined pathways to first birth. These pathways are composed of the transitions that were described above. Search theory, economic arguments and the SDT explain the relationship between educational attainment and the transition to first union while from the SDT and POD expectations on how educational attainment relates to the transition to first birth within different union types can be derived. Additional arguments were used to predict the influence of education on the transition to first birth after union dissolution or repartnering.

[Table 1 about here]

As Table 1 shows, it is not straightforward from previous literature how the role of education changes across the possible pathways to first birth because the different arguments lead to contradictory expectations. Additionally, these theories do not provide arguments for how the influence of education would change across the early family life course. However, it might be that the role of education is more important in some transitions than in some others. For example, it might be that education plays a more influential role at the earlier stages of the family life course. If this is the case, education would be expected to have a stronger influence on the partnership transitions than on the transition to motherhood. On the other hand, it might also be the case that the role of education is more crucial in the transition to parenthood. Finally, it is possible that the role of education changes differently across the early family life course in the different countries.

Cross-national Variation

So far I have assumed that the relationship between education and the different pathways to first birth are the same for all countries. However, previous comparative studies suggest that there are cross-national variations in the influence of education on the different family life course transitions (e.g. Billari & Liefbroer, 2010; Elzinga & Liefbroer, 2007; Kalmijn, 2007; Perelli-Harris, Sigle-Rushton, et al., 2010). The impact of educational attainment on the different partnership and family formation transitions might vary across countries due to cultural, historical and institutional differences (Esping-Andersen, 1990; Mayer, 2001). These country characteristics might mediate the relationship between educational level and the examined partnership and parenthood transitions.

This paper is primarily interested in exploring the possible cross-national variation in the influence of educational attainment on the different pathways to first birth and does not aim to directly test specific hypotheses about cross-country differences.

Data and Methods

This study analyses data from the Harmonized Histories (Perelli-Harris, Kreyenfeld, & Kubisch, 2010), a set of nationally representative surveys which include retrospective monthly information on union formation and childbearing. The data primarily come from the first wave of the Generations and Gender Surveys (collected between 2004 and 2010) except for the Netherlands (Fertility and Family Survey, 2003), Spain (Spanish Fertility Survey, 2006), the UK (British Household Panel Study, 2005/06), and the United States (National Survey of Family Growth, 2007). This study examines data from Austria, Belgium, Bulgaria,

Estonia, France, Italy[1], Lithuania, the Netherlands, Norway, Romania, Russia, Spain, the UK, and the US.

Although cross-sectional weights are available in most surveys, the present analysis does not apply weights because those are only representative of the population structure of each country in the year of the survey and no retrospective or transition-specific weights can be derived from them. Given the augmented data structure, used in the analyses, estimating the models using the weights provided in the datasets would assume that the weights are constant across transitions and over time, which would be unrealistic. Additionally, this study aims to explore the relationship between educational attainment and the possible pathways to first birth rather than providing population estimates of the influence of education.

The influence of education on the hazard of each examined partnership and parenthood transition is estimated using a multistate event history model. Figure 1 defines the discrete state space, where the rectangular boxes represent the examined partnership and parenthood states and the arrows indicate the possible transitions between these states.

[Figure 1 about here]

Over time individuals move between the different partnership and parenthood states: being never partnered (S), cohabitation (C), direct marriage (M), marriage preceded by cohabitation with the same partner (CM), the dissolution of both a cohabiting and a marital union (D), re-partnering after union dissolution (R), and the birth of a first child (B). These relationships are embedded in a cross-national and historical context.

[1] In the Italian GGS, the month of birth of the respondents is not available due to data protection. Therefore, a uniform distributed random variable was used to create this variable. Furthermore, the Italian GGS was based on a household sample as opposed to the other GGS surveys which sampled individuals.

This model differentiates between direct marriage and marriage that was preceded by cohabitation allowing for the influence of education on the transition hazards to first birth to differ for direct marriage and for marriage that was preceded by cohabitation. Previous studies typically assumed no differences in the influence of education on the transition to first birth from a direct marriage and from marriage that was preceded by cohabitation. By differentiating between these transitions one can learn more about the role of premarital cohabitation in the early family life course. Note that the union dissolution state (D) does not distinguish between the dissolution of a cohabiting and a marital relationship. Similarly, repartnering (R) can refer to both a higher order cohabitation and a higher order marriage. Due to the small number of cases who experienced these transitions, it is necessary to merge these transitions irrespective of the state of origin in order to get more reliable estimates and to avoid estimation problems.

A multistate event history model has two basic assumptions. First, it assumes that the observed events are generated by a stochastic process (Rajulton, 2001) and that the movements between the different states are stochastic (Andersen & Keiding, 2002; Hougaard, 1999). Second, it assumes the Markov property which means that the transition from the origin state to the destination state only depends on the occurrence of the origin state (Rajulton, 2001). In other words, the present behaviour of an individual is enough to predict its future behaviour (Andersen & Keiding, 2002; Hougaard, 1999) and it does not matter through which path the individual arrived at the destination state. The above defined model is an extension to the Markov model; by defining the multistate model to include the state 'marriage preceded by cohabitation' (CM), the exact pathway that women followed until the occurrence of a union dissolution is known. As explained earlier, after the occurrence of a union dissolution, it is not possible to trace which states women came from.

The multistate event history model is estimated by fitting a continuous-time stratified Cox regression where each transition is represented by a different stratum. Covariates are incorporated as transition-specific covariates allowing for the effect of each variable to differ across transitions. The transition hazards for individual *k* are given by:

$$\lambda_{ij}\ t\ \boldsymbol{Z}\ =\ \lambda_{ij,0}\ t\ \ \exp\ \boldsymbol{\beta}^T\boldsymbol{Z}_{ij} \qquad (1)$$

where *ij* indicates a transition from state *i* to state *j*, $\lambda_{ij,0}\ t$ is the baseline hazard of this transition, $\boldsymbol{Z}$ is the vector of covariates at baseline and $\boldsymbol{Z}_{ij}$ is the vector of transition-specific covariates. This model allows for the covariate effects to differ across transitions as well as for a separate baseline hazard for each transition. This implies that estimating such a model does not assume that the hazards of the different transitions are proportional.

In principle, estimating a Cox model stratified by transitions is analogous to fitting several Cox regressions for each transition separately on an augmented dataset where each line represents a possible transition that the individuals are at risk for (Putter et al., 2006). However, estimating a single stratified Cox model using data in long format makes further calculations easier (Putter, 2011b).

The estimates $\boldsymbol{\beta}$ and $\Lambda_{ij,0}(t)$ can be found by maximising the partial likelihood

$$L\ \boldsymbol{\beta}\ = \prod_{\substack{transition \\ i\to j}} \prod_{\substack{k=1 \\ d_{ij,k}=1}}^{n} \frac{\exp(\beta^T Z_{ij,k})}{\sum_{l\epsilon R_i(t_{ij,k})} \exp(\beta^T Z_{ij,l})}$$

where $t_{ij,k}$ is the event or censoring time of individual *k* for transition *i→j*, $d_{ij,k} = 1$ if individual k has an event for transition *i→j*, 0 otherwise, and where $R_i(t)$ is the risk set of state *i* at time *t*, i.e. the set of individuals who are in state *i* at time *t* (t begins here at age 15). The estimate of the cumulative baseline hazard of transition *i→j* is the Nelson-Aalen estimate of:

$$\Lambda_{ij,0}\ t\ = \sum_{\substack{k=1 \\ t_{ij,k} \leq t}}^{n} \frac{d_{ij,k}}{\sum_{l \epsilon R_i(t_{ij,k})} \exp(\beta^T Z_{ij,l})}$$

The stratified Cox model is estimated separately for each country. In the analyses, women are observed from age 15 (t_0 = age 15) until age 45, the time of the survey or the time of first birth, whichever happens earlier. Time is measured in months since age 15. I apply the clock-forward approach which means that time *t* refers to the time since individuals entered the initial state (i.e. never partnered). This implies that the dependent variable is time since age 15 until the occurrence of any of the transitions.

Variables

Level of Education. The highest level of education is measured at the time of the survey and is classified into six categories based on the International Standard Classification of Education (ISCED, 1997). This study compares low (ISCED 0, ISCED 1, and ISCED 2) and highly educated (ISCED 5 and ISECD 6) women to their medium educated (ISCED 3 and ISCED 4) counterparts. A time-varying indicator is created using information on the year and month of reaching the highest level of education, assuming continuous education from age 15 and that acquiring medium level of education takes 4 additional years after having completed low education and that high education takes an additional 3 years after having completed medium education. As the datasets do not hold information on whether the respondents have interrupted their educational careers, continuous education is only assumed up to age 25 for respondents who are still enrolled at the time of the survey. In most countries, some information (less than 2.5%) is missing on the year and/or month of reaching the highest level of education. In Norway and the United Kingdom, the proportion of missing information is 7.9% and 6.3%, respectively. In the US, it is 57% and in Spain 62%. For all countries except the United States, the missing values are imputed using information on the median age of

finishing education by educational level, birth cohort and country. In the United States, the year and month of reaching the highest education is missing for all respondents who have a higher than college education. Therefore, external information on the length of each educational level is used to estimate the age at leaving school for each educational level (Snyder, Dillow, & Hoffman, 2008). While this approach allows for investigating the role of education in the partnership and family formation over the early family life course, the relationship between partnership and family formation and educational attainment should not be interpreted as causal because several unobserved or unmeasured factors, which are not accounted for in this study, could potentially explain some of this relationship. The distribution of this variable is shown in Table 2.

[Table 2 about here]

Educational enrolment. Enrolment in education is measured by a time-varying covariate. It is 1 for each period in which the respondents are enrolled in education and 0 for when the respondents are not enrolled (reference category). As information is available only retrospectively, we do not have information about possible interruptions of the educational career. This means that this variable is 1 for periods before the respondent has reached her highest educational level and 0 afterwards.

Birth cohort. Respondents are grouped into two birth cohorts: those born between 1950 and 1965 (reference) and those born between 1966 and 1979. Note that in the United States and Austria, only respondents born after 1961 and 1963, respectively, were interviewed. Thus, in these countries, the proportion of the sample in the first birth cohort is considerably smaller (18% in both countries) than in the other countries, as shown in Table 2.

Descriptive Results

Table 3 describes the number (and percentage) of events for each transition by country as well as the total number of person periods for each of the transitions. Note that the total number of person periods does not equal the total number of women who entered each transition because of the additional episode splitting that had to be performed due to the presence of the time-varying education variable. However, as the internal computations for a Cox model assume that the additional rows represent other individuals and the rows are handled as a set of independent observations (Therneau & Grambsch, 2000), this paper interprets the numbers and proportions as if they were the numbers and proportions of women in the study.

Table 4a and 4b show the number and proportion of women, respectively, for each element of the six possible pathways to first birth by educational level and country. In all examined countries, most never partnered women who made the transition to first birth whilst unpartnered (S → B) were low educated, followed by the medium and the high educated. The trend was very similar for the pathway to first birth within cohabitation; most women who experienced a first cohabitation (S → C) and a first cohabiting birth (C → B) were low educated, followed by the medium and high educated. Although in the UK and the Netherlands, slightly more medium educated women experienced the transition to a first cohabitation than highly educated women.

[Table 4a and 4b about here]

The patterns were somewhat different for the pathway to first birth within marriage that was preceded by cohabitation. In most countries, mainly lower educated women married their cohabiting partner (C → CM) and had a first child within such a marital union (CM →

B). However, in Austria, Lithuania, the Netherlands, Russia, and the UK, somewhat more medium educated women did so than higher educated women. Additionally, in the US, the proportions of women who experienced these transitions were very similar in all three educational categories.

The pathway to first birth within direct marriage was also mainly experienced by the lower educated; the highest proportion of women who experienced the transition from being never partnered to direct marriage (S → M) and who had a first child within direct marriage (M → B) were low educated, followed by the medium and the highly educated in all countries. The same holds for the pathway to first birth following a union dissolution but without having formed a new union (D → B).

Finally, somewhat more cross-national variation was found for the pathway to first birth after repartnering. Most women who experienced the transitions that constitute this pathway (D → R and R → B) were low educated in the majority of the countries although the difference between the proportion of low and medium educated were quite small in some countries. Additionally, in Russia and the UK, the highest proportion of women who experienced these transitions belonged to the medium educated.

Multivariate Results

Table 5 shows the hazard ratios (i.e. the exponential of the regression coefficients) from the stratified Cox regression. For categorical variables, the hazard ratios are interpreted as relative risks, that is, a hazard ratio larger than 1 indicates that the risk of the given transition is higher for this group of women than for the reference group while a hazard ratio smaller than 1 means that this group of women have a smaller risk of experiencing that particular transition compared to women in the reference group.

As mentioned in the theoretical framework, the influence of educational attainment is examined on six pathways from being never partnered and childless at age 15 to a first birth. These pathways are the following: transition to first birth while (1) being never partnered (S → B), (2) within nonmarital cohabitation (S → C → B), (3) within marriage that was preceded by cohabitation (S → C → CM → B), (4) within direct marriage (S → M → B), (5) after union dissolution (D → B) and (6) following repartnering after a union dissolution (D → R → B). As the definition of states D and R does not allow for differentiating between pathways into these states, the influence of education on the transitions into union dissolution (C → D, M → D, and CM → D) will not be discussed. In the following sections, the results of the stratified Cox models are discussed for each pathway to first birth.

Transition to First Birth while being Never Partnered

In most countries, the transition to a single birth had a negative educational gradient. In other words, lower educated women had a higher risk and highly educated women had a lower risk than medium educated women to experience a birth while being never partnered when controlling for the influence of educational enrolment and birth cohort. However, in Austria, educational attainment did not seem to have a significant influence on this transition, while in Belgium, Estonia, and Lithuania, only one of the coefficients was significant (and only marginally). It is important to mention that as previously shown, these calculations were based on a rather small number of individuals which might be the reason why no significant differences could be detected between low and medium educated or high and medium educated women in some countries.

Transition to First Birth within Nonmarital Cohabitation

This pathway has two elements: the transition from being childless and never partnered to nonmarital cohabitation, and the transition from this cohabitation to a first birth within this union. The results indicated a positive educational gradient of the transition to first cohabitation; higher educated women had a higher risk and lower educated women had a lover risk of experiencing cohabitation as a first type of union compared to their medium educated counterparts in Austria, Belgium and France controlling for educational enrolment and birth cohort. Also, in Norway and the UK, women with medium education were more likely to experience this transition than low educated women suggesting a partial positive gradient. However, in Romania and the US, the results indicated a negative educational gradient. Additionally, the transition rate into a first cohabitation did not differ significantly between women from different educational backgrounds in Bulgaria, Estonia, Italy, Lithuania, the Netherlands, Russia, and Spain.

Low educated women had the highest risk of experiencing a transition from nonmarital cohabitation to a cohabiting first birth, while those with the highest education had the smallest risk in France and the US, where the coefficients belonging to both low and high education were significant. Additionally, the results indicated a similar pattern in Bulgaria, Estonia, Lithuania, Russia and the UK (significant or marginally significant coefficients of high education) as well as in Italy, the Netherlands and Spain (significant coefficients of low education). Interestingly, in Belgium, Norway, and Romania, low and high educated women did not have a significantly different cohabiting first birth risk than medium educated women.

These results imply that when examining the influence of education on the whole pathway to first birth within nonmarital cohabitation, even for countries where more educated women were more likely to cohabit (Austria, France, and the UK), it was the lower educated who had a higher cohabiting first birth risk. Additionally, in these countries, the role of education seemed to be more important for the transition to a first cohabiting birth than for

the transition to first cohabitation. The same holds for Bulgaria, Estonia, Italy, Lithuania, the Netherlands, Russia and Spain, where education only played a significant role for this transition. On the other hand, in Belgium, Norway, and Romania, the influence of education was only important for the transition to cohabitation and not for the transition to a cohabiting first birth.

Transition to First Birth within Marriage that was preceded by Cohabitation

The pathway to first birth within marriage that was preceded by cohabitation has three components: the transition to first cohabitation (discussed in the previous section), the transition from cohabitation to marrying the same partner, and the transition to first birth within this marital union. In Bulgaria, Estonia, France, Norway, Romania, and the US, educational attainment had a positive gradient on the transition from premarital cohabitation to marriage. Thus, in these countries, more educated women had higher transition rates into marrying their cohabiting partner than their lower educated counterparts when holding other variables in the model constant. In Spain, both higher and lower educated women were more likely to marry their cohabiting partner than those with medium education. No significant differences between low/high and medium educated women were detected in the other countries.

In Belgium, Bulgaria and Norway, the positive educational gradient of the transition to first birth within marriage that was preceded by cohabitation was a marginally significant. Interestingly, this relationship pointed in the opposite direction in Italy; while in the US both low and high educated women were more likely than medium educated women to experience this transition. In the other countries, education did not have a significant influence on this transition.

In general, this means that educational attainment had a positive influence on the pathway to first birth within marriage that was preceded by cohabitation, although it was only in Norway, where education had a significant influence on all three consecutive transitions. Furthermore, education did not seem to influence any of these transitions in Lithuania, the Netherlands, and Russia. The influence of education was found to be the most important on the transition from cohabitation to marriage in Bulgaria, Estonia, Norway, Romania, and Spain, while in Austria, Belgium, France, and the UK, it was the transition to a first cohabitation where education had the strongest effect.

Transition to First Birth within Direct Marriage

The transition to first birth via direct marriage involves two consecutive transitions: the transition to direct marriage and the transition to first birth within this marriage. Holding all other variables constant, in Spain, the Netherlands, Italy, and France, education had a negative gradient on the transition to direct marriage, that is low educated women had a higher risk than medium educated women to experience this transition. On the contrary, in the other countries (except for Romania, the UK, and the US where no significant differences were found between low and medium or between high and medium educated women) education had a positive gradient; highly educated women had a higher risk of marrying directly than their less educated counterparts.

The risk of a marital first birth was smaller for low educated women than for medium educated women in Austria and France and high educated women had higher risks of a marital first birth than medium educated women in Norway (positive educational gradient). However, the educational gradient was negative in Italy, the Netherlands, Spain, the UK and the US. Educational attainment did not influence the transition to a marital first birth in Belgium, Bulgaria, Estonia, Lithuania, Romania, and Russia.

Examining the influence of education for countries where education had a significant influence on both consecutive transitions revealed that in Austria and Norway, education had a positive gradient on the whole pathway, whereas in Italy, the Netherlands, and Spain, it was the low educated who had a higher risk of both transitions. Interestingly, in France, low educated women had higher risks to marry but it was the higher educated who were more likely to experience a first birth within this union. Throughout this pathway, education had a stronger influence on the transition to first marriage in most countries, but in France, the UK, and the US, it had the strongest effect on the transition to first birth after direct marriage. Additionally, in Romania, education did not have a significant influence on any of the transitions within this pathway.

Transition to First Birth after Union Dissolution

After having experienced the dissolution of either a cohabiting or a marital union, some women had a first birth without having formed a new coresidential union. In France, the Netherlands and the UK, lower educated women were much more likely to experience such a first birth that their medium educated counterparts while in Estonia, highly educated women had the highest risks. In the other countries, no significant relationship between education and the risk of a first birth after union dissolution was found.

Transition to First Birth after Repartnering

The transition to first birth within a new partnership consists of two steps: the transition from union dissolution to re-partnering and the transition from re-partnering to first birth. In Belgium, Norway, Spain, and the US, repartnering after a union dissolution had a positive educational gradient although most of these effects were only marginally significant and only the coefficients belonging to low education reached significance. After having repartnered, it

was also the more educated who were more likely to experience a first birth within this new union in Estonia, France, Spain, and the US, although, again, these effects were only marginally significant. Caution is needed when interpreting these results due to the small number of cases who experienced these transitions in some countries.

Education had a significant positive effect on both of these transitions in Spain and the US indicating that the more educated were more likely to find a new partner following the dissolution of a previous union as well as to have a child after having found a new partner. The influence of education was stronger for the transition to first birth after repartnering in Estonia, France, Spain, and the US while in Belgium and Norway education seemed to have a more important role in the transition to repartnering after union dissolution. In the other countries, no significant influence of education on this pathway could be detected.

Conclusion and Discussion

Taking a life course perspective, this study examined the changing influence of educational attainment on six possible pathways to first birth: while being never partnered, within nonmarital cohabitation, within marriage that was preceded by cohabitation, within direct marriage, after union dissolution and following repartnering after union dissolution. Using multistate event history models, this paper provided an innovative approach to studying the changing influence of education in the entire early family life course.

In line with the expectations and with previous studies, more educated women had a smaller risk of a transition to first birth while being never partnered in all examined countries except for Austria, where the influence of education was not significant. This finding is in line with the POD argument and indicates that this pathway to first birth was mainly experienced by more disadvantaged women. However, in some countries, the number of single births was quite small, probably because women born between 1950 and 1979

typically got married in case of an extramarital pregnancy, although the prevalence of shotgun marriages might vary across countries and cohorts.

Additionally, in Austria, France, and the UK, more educated women had a higher risk of experiencing a first cohabitation but a smaller risk of a cohabiting first birth compared to low educated women. This finding is partly in line with previous findings and indicates that in these countries cohabitation as a first union type was not associated with more disadvantage in the examined cohorts. It seems that what mattered is whether they had a first birth within such a nonmarital union. In Romania and the US, lower educated women were more likely to cohabit and in the US, they were also more likely to experience a first birth within this union. This indicates that in the US, the pathway to first birth through nonmarital cohabitation was typically experienced by the more disadvantaged and thus it might also mean that experiencing this pathway might have played a role in the accumulation of disadvantage over the life course. Previous studies found a consistent negative gradient of education on childbearing within cohabitation (Perelli-Harris, Sigle-Rushton, et al., 2010) whereas this study found no significant effects in Belgium, Norway, and Romania. Although both studies used the same data, Perelli-Harris et al (2010) examined period rather than cohort effects, which might explain the different findings.

Whereas previous studies usually did not differentiate between the transition to marriage from premarital cohabitation and direct marriage, the present paper investigated these transitions separately in order to better understand the role of educational attainment and premarital cohabitation in the early family life course. This paper demonstrated the importance of this distinction by showing that the transition from a first cohabitation to marriage had a positive educational gradient, even in countries where the transition to premarital cohabitation had a negative gradient. This finding opposes the theoretical arguments of the SDT according to which higher educated women would be more likely to

stay within cohabitation. Furthermore, the transition to first birth from a marriage that was preceded by cohabitation was most common among the more educated in Belgium, Bulgaria, and Norway. In Italy, lower educated women had a higher risk of a marital first birth following premarital cohabitation while in the US both low and high educated women were more likely than medium educated women to have a first birth within such a union. These results indicate that in most countries, where a significant influence of education could be detected, the pathway to first birth within marriage that was preceded by cohabitation was typically experienced by women who were better off.

Higher educated women had a higher risk of a direct marriage as well as a marital first birth in Austria and the Netherlands indicating that in these countries, the pathway to first birth through direct marriage was primarily experienced by more educated women. However, in France, Lithuania, and Russia, higher educated women had a smaller risk of a first direct marriage as well as of a marital first birth suggesting that experiencing a first birth via direct marriage was primarily the pathway of the lower educated in these countries. Additionally, in Estonia, more educated women were less likely to experience a direct marriage but had a higher risk of a marital first birth than lower educated women.

Previous studies did not directly examine the transition to first birth after the dissolution of a first union. In line with the expectations, education had a negative gradient on the transition to first birth after union dissolution for women who did not find a new partner. However, these results were only significant in France, the Netherlands and the UK. Additionally, this trend was the opposite in Estonia. These findings indicate that the pathway to first birth following the dissolution of a first union was mainly the pathway of the more disadvantaged in these countries supporting the argument that experiencing a first birth after union dissolution but without having formed a new union is similar to the experience of a single first birth.

In line with the expectations, low educated women had a smaller risk of both repartnering after the dissolution of a first union and of a first birth after repartnering. However, these results were only significant in some countries. This might indicate that this pathway was mainly experienced by women from more advantaged backgrounds. Thus, the experience of a union dissolution is not necessarily associated with disadvantage as long as women find a new partner.

Additionally, this paper compared the strength of education's influence across the pathways to first birth. The results indicated that overall the influence of educational attainment is stronger on the transition to first birth within cohabitation and after repartnering than on partnership transitions while the opposite was found for the pathways leading to a marital first birth. This finding implies that socio-economic background matters more for the transition to a cohabiting first birth and for a first birth after repartnering but that it is more important for partnership transitions in the pathways to a marital first birth. It might be that having a child within cohabitation or within a new relationship is associated with more disadvantage and thus this seems to be the point in the early family life course where the influence of socio-economic background is crucial. On the other hand, having a marital first birth is associated with more advantage and the influence of education plays an important role in the partnership transitions that lead to marriage.

While this study demonstrated the importance of examining the changing influence of educational attainment on the pathways to first birth, it also has some limitations. First, it might be that the meaning of the different educational levels has changed over time; what is considered low education based on the ISCED categories might have been considered medium educational attainment for women belonging to earlier birth cohorts. Second, belonging to a certain educational group and making certain family life transitions might reinforce each other. That is, it might be that the highest level of education leads to certain

transitions or vice versa, the experience of certain transitions might influence the level of education. As mentioned earlier, this study did not attempt to identify a causal relationship between education and the different family life course transitions. Additionally, some studies argue that family life transitions and educational transitions should be modelled simultaneously as these decision processes are interrelated (Upchurch et al., 2002). Others argue that partnership transitions and the transition to first birth should be studied simultaneously (Baizán et al., 2003; Baizán, Aassve, & Billari, 2004; Brien et al., 1999; Steele et al., 2005). However, others concluded that using simultaneous hazard models lead to results which are extremely hard to interpret (Baizán et al., 2003, 2004) and this limits the number of transitions that can be examined within the same model. Last, retrospective information on the start and end date of cohabiting unions might be subject to recall errors and thus might be less reliable than the information on marriage or first birth dates.

Nonetheless, this study demonstrated that using a multistate framework to study the changing influence of education on the different pathways to first birth not only allows for examining the role of education on every partnership and parenthood transition but also for comparing the strength of education's influence across the different pathways. By doing so this study has shown for the first time that the role of education is crucial for the transition to first birth within cohabitation and after repartnering than on partnership transitions while for the pathways leading to a marital first birth, education has a more important influence on the partnership transitions.

Further Plans and Discussion Points

The current models assume the proportionality of the hazards. I am aware of this and that one has to check whether this assumption holds. In case this assumption does not hold (which is most likely), one needs to include interaction effects between time and educational attainment

to allow for the influence of education to vary over time. The models presented in this paper do not include such interaction terms. The main reason for this is that the models are already complicated due to the transition specific covariates (2 educational level variables for 13 transitions = 26 variables just for educational level) and thus including interaction effects between time and educational level for each transition means the addition of 26 more covariates. Consequently, the models do not converge for most countries and thus they cannot be estimated[2]. I suspect that this might be due to the small cell sizes in some cases, e.g. a single birth is quite rare in most countries but also the transitions D → B and R → B do not occur very often. Maybe a solution could be to re-fit the models without states D and R (and thus censoring individuals who experience a union dissolution) and then try to refit the models with the interaction effects. Additionally, maybe by including these interaction effects, it would be possible to separate the effect of education on the timing and type of the transitions.

Another interesting variable to investigate would be the time of arrival (age) in cohabitation (so for example, for the transition CM → B or CM → D, it might be relevant at which age the respondent started to cohabit). When I included this variable only, the effects were significant for all countries. But when education is also included, the models did not converge anymore.

Furthermore, it could be interesting to see the influence of duration in the origin states for each transition. I estimated some models with these variables (all had a significant influence), but I could not add both education and duration to the model, again, due to convergence issues. Maybe this problem would disappear in a model without states D and R.

[2] I also tried to change the convergence criteria (both the number of iterations and the value of the relative change in the log partial likelihood) but this did not lead to successful estimation either.

Table 1. Summary of the Theoretical Expectations for each Element of the Pathways to First Birth by Theories and Arguments.

Pathway to first birth	**Elements of the pathway** (in case it consists of more than one transitions)	**Search theory & Oppenheimer**	**Becker**	**SDT**	**POD**	**Other arguments**
(1) Birth while being never partnered				+	-	
(2) Birth within cohabitation	Transition from never partnered to cohabitation	-	+	+		
	Transition from cohabitation to birth			+	-	
(3) Birth within marriage that was preceded by cohabitation	Transition from never partnered to cohabitation	-	+	+		
	Transition from cohabitation to marriage			-		
	Transition from marriage to birth			-	+	
(4) Birth within direct marriage	Transition from never partnered to marriage	+	-	-		
	Transition from marriage to birth			-	+	
(5) Birth after union dissolution						-
(6) Birth after repartnering	Transition from dissolution to repartnering					+
	Transition from repartnering to birth					+

Note: '+' indicates a positive expected relationship between educational attainment and the risk of the given transition, i.e. higher educated women are expected to be more likely to experience the given transition than lower educated women. Consequently, '-' indicates a negative expected relationship between educational attainment and the risk of the given transition.

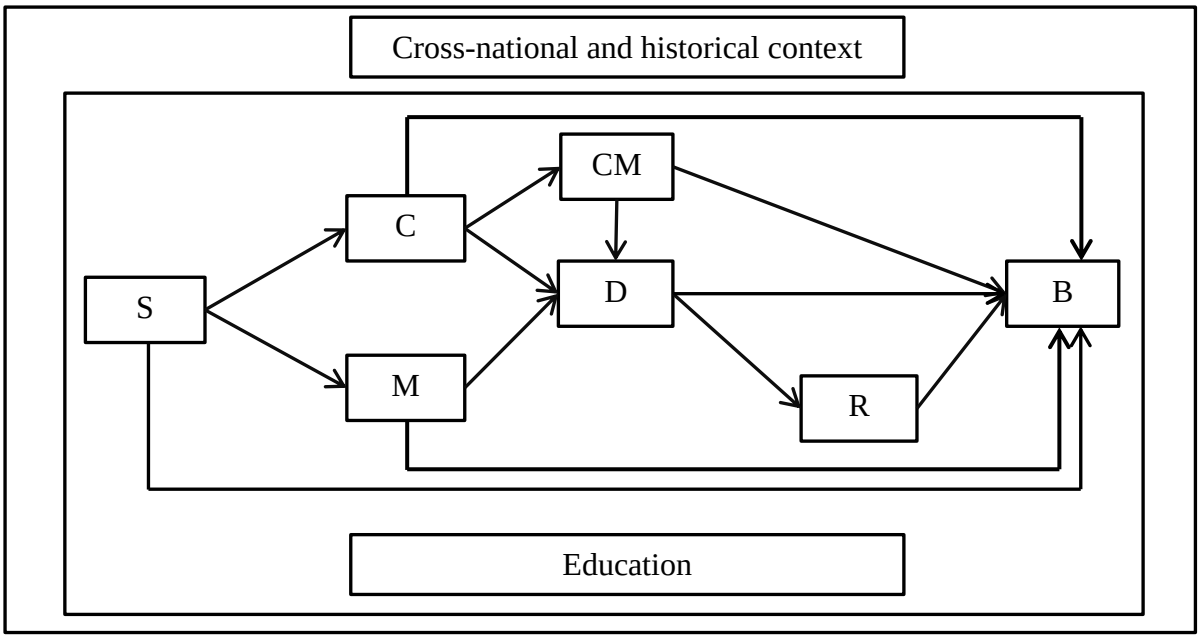

Figure 1. Multistate event history model to examine the influence of education across the family life course in a cross-national context.

Table 2. Distribution of the Variables Used, Proportion of Each Category (%), Total Sample Size and Number of Person-Periods

	Education			Cohort		Sample size	No. of Person-periods
	low	medium	high	1950-1965	1966-1979		
	%			%			
Austria	23	69	8	18	82	3159	17744
Belgium	34	36	30	60	40	3044	14581
Bulgaria	26	60	14	45	55	7203	34684
Estonia	19	58	23	53	47	4223	23675
France	31	45	24	54	46	5255	26983
Italy	46	47	7	54	46	10577	70376
Lithuania	16	66	18	54	46	4860	34111
the Netherlands	31	48	21	51	49	3846	25117
Norway	42	42	16	52	48	7805	36163
Romania	14	70	16	57	43	5980	29906
Russia	14	70	16	57	43	5980	29933
Spain	48	34	18	50	50	4128	30136
the UK	11	34	55	48	52	4906	26912
United States	24	28	47	18	82	6571	34111

Table 3. Number (and %) of Events and Total Number of Person Periods for Each Transition by Country.

	S --> C	S --> M	S --> B	Total entering S	C --> CM	C --> D	C --> B	Total entering C
Austria	1386 (43)	264 (8)	154 (5)	3257	644 (39)	314 (19)	324 (22)	1651
Belgium	818 (28)	600 (21)	104 (4)	2881	537 (53)	106 (11)	206 (16)	1006
Bulgaria	2174 (31)	1224 (18)	193 (3)	6975	1789 (77)	42 (2)	290 (12)	2325
Estonia	1390 (29)	893 (18)	212 (4)	4874	738 (46)	120 (7)	459 (29)	1601
France	1809 (34)	732 (14)	179 (3)	5353	833 (39)	327 (15)	568 (26)	2163
Italy	1029 (6)	6989 (41)	309 (2)	17006	480 (45)	221 (21)	212 (20)	1069
Lithuania	481 (11)	1503 (34)	206 (5)	4434	331 (62)	36 (7)	91 (17)	535
Netherlands	1472 (30)	1175 (24)	55 (1)	4861	854 (50)	266 (16)	179 (10)	1705
Norway	2775 (43)	810 (13)	306 (5)	6403	1056 (31)	635 (18)	968 (28)	3436
Romania	621 (12)	2187 (44)	120 (2)	4971	390 (59)	26 (4)	188 (29)	657
Russia	1082 (17)	2105 (33)	306 (5)	6452	638 (52)	120 (10)	292 (24)	1223
Spain	840 (12)	2686 (39)	212 (3)	6926	382 (42)	54 (6)	212 (23)	909
the UK	1259 (21)	961 (16)	355 (6)	6023	557 (39)	280 (19)	268 (19)	1438
United States	1652 (22)	1092 (15)	608 (8)	7427	762 (41)	430 (23)	425 (23)	1863

	M --> D	M --> B	Total entering M	CM --> D	CM --> B	Total entering CM	D --> R	D --> B	Total entering D
Austria	12 (4)	234 (83)	281	48 (7)	534 (80)	670	264 (63)	32 (8)	420
Belgium	6 (1)	537 (85)	632	60 (10)	439 (77)	573	128 (67)	16 (8)	191
Bulgaria	24 (2)	1165 (86)	1352	20 (1)	1697 (88)	1926	35 (36)	21 (22)	96
Estonia	41 (4)	834 (82)	1020	41 (5)	667 (81)	819	111 (49)	39 (17)	227
France	35 (4)	668 (85)	784	41 (5)	726 (84)	869	233 (52)	39 (9)	446
Italy	188 (3)	6086 (86)	7091	25 (5)	348 (72)	484	106 (24)	60 (13)	446
Lithuania	40 (2)	1408 (82)	1719	9 (2)	290 (79)	367	27 (30)	28 (30)	89
Netherlan	57 (4)	1032 (81)	1280	43 (5)	716 (81)	888	251 (61)	41 (10)	413
Norway	41 (4)	737 (78)	942	67 (6)	922 (79)	1174	548 (60)	62 (7)	912
Romania	48 (2)	1991 (86)	2323	12 (3)	323 (79)	410	27 (30)	20 (23)	88
Russia	100 (4)	1956 (82)	2400	42 (6)	573 (82)	698	120 (41)	85 (29)	294
Spain	54 (2)	2407 (87)	2775	9 (2)	310 (78)	398	33 (26)	27 (22)	125
the UK	94 (9)	798 (73)	1093	40 (7)	397 (69)	577	269 (59)	65 (14)	456
United Sta	180 (14)	822 (65)	1263	106 (13)	532 (64)	829	418 (52)	139 (17)	807

	R --> B	Total entering R
Austria	150 (54)	278
Belgium	78 (61)	128
Bulgaria	24 (66)	36
Estonia	74 (63)	118
France	143 (6)	237
Italy	59 (55)	107
Lithuania	15 (56)	27
Netherlan	134 (52)	257
Norway	408 (69)	590
Romania	17 (61)	28
Russia	74 (60)	124
Spain	19 (54)	35
the UK	162 (58)	277
United Sta	228 (51)	443

Table 4a. The Proportion of Low (L), Medium (M) and Highly (H) Educated Women Who Experienced Each Element of the Six Possible Pathways to First Birth by Country and Transition.

	S --> C			S --> M			S --> B			C --> CM			C --> B			M --> B			CM --> B			D --> B			D --> R			R --> B		
	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
Austria	0.47	0.48	0.05	0.52	0.44	0.04	0.55	0.43	0.02	0.44	0.50	0.06	0.50	0.47	0.04	0.52	0.44	0.04	0.44	0.50	0.06	0.54	0.44	0.03	0.48	0.46	0.06	0.47	0.47	0.06
Belgium	0.46	0.33	0.21	0.49	0.34	0.17	0.60	0.30	0.10	0.47	0.33	0.21	0.46	0.35	0.19	0.49	0.34	0.17	0.46	0.33	0.21	0.58	0.30	0.13	0.45	0.36	0.19	0.45	0.38	0.17
Bulgaria	0.49	0.44	0.07	0.52	0.40	0.08	0.56	0.37	0.07	0.47	0.46	0.08	0.65	0.31	0.04	0.53	0.40	0.07	0.47	0.46	0.07	0.55	0.40	0.05	0.54	0.40	0.06	0.52	0.43	0.05
Estonia	0.46	0.42	0.12	0.46	0.42	0.12	0.51	0.38	0.11	0.46	0.43	0.11	0.49	0.41	0.10	0.46	0.42	0.12	0.46	0.43	0.11	0.50	0.41	0.09	0.43	0.44	0.12	0.41	0.44	0.15
France	0.45	0.38	0.17	0.56	0.34	0.11	0.61	0.34	0.06	0.41	0.40	0.19	0.51	0.36	0.14	0.53	0.34	0.11	0.41	0.40	0.19	0.56	0.34	0.10	0.42	0.37	0.21	0.41	0.39	0.20
Italy	0.54	0.41	0.05	0.62	0.34	0.04	0.68	0.29	0.03	0.52	0.42	0.05	0.61	0.34	0.05	0.64	0.33	0.03	0.56	0.40	0.04	0.61	0.36	0.03	0.47	0.46	0.06	0.46	0.46	0.08
Lithuania	0.46	0.44	0.10	0.48	0.44	0.09	0.56	0.38	0.06	0.44	0.45	0.11	0.50	0.44	0.06	0.48	0.44	0.08	0.46	0.46	0.09	0.50	0.44	0.07	0.47	0.45	0.09	0.47	0.49	0.05
Netherlands	0.44	0.45	0.11	0.56	0.37	0.07	0.62	0.34	0.03	0.43	0.46	0.11	0.52	0.41	0.07	0.58	0.36	0.06	0.43	0.46	0.11	0.62	0.32	0.06	0.42	0.48	0.10	0.45	0.47	0.08
Norway	0.60	0.30	0.09	0.64	0.28	0.08	0.73	0.21	0.06	0.59	0.30	0.11	0.64	0.29	0.07	0.64	0.28	0.08	0.58	0.31	0.11	0.7	0.24	0.05	0.60	0.31	0.09	0.60	0.31	0.09
Romania	0.59	0.38	0.04	0.57	0.40	0.04	0.66	0.34	0.00	0.54	0.42	0.04	0.70	0.29	0.01	0.58	0.39	0.03	0.56	0.41	0.03	0.58	0.40	0.02	0.55	0.39	0.06	0.65	0.28	0.06
Russia	0.47	0.46	0.07	0.49	0.46	0.06	0.53	0.38	0.08	0.46	0.47	0.07	0.51	0.45	0.05	0.49	0.45	0.05	0.47	0.47	0.06	0.51	0.44	0.05	0.42	0.50	0.08	0.39	0.55	0.06
Spain	0.53	0.33	0.14	0.63	0.28	0.09	0.66	0.27	0.07	0.51	0.33	0.16	0.60	0.30	0.10	0.64	0.27	0.08	0.53	0.32	0.15	0.66	0.27	0.06	0.50	0.37	0.13	0.45	0.45	0.10
the UK	0.35	0.38	0.27	0.41	0.40	0.19	0.59	0.30	0.11	0.30	0.37	0.33	0.43	0.40	0.18	0.42	0.40	0.18	0.31	0.37	0.32	0.45	0.40	0.15	0.31	0.41	0.29	0.32	0.41	0.27
United States	0.42	0.32	0.26	0.44	0.33	0.23	0.55	0.32	0.13	0.34	0.33	0.33	0.52	0.32	0.16	0.45	0.33	0.21	0.34	0.33	0.33	0.51	0.34	0.16	0.35	0.34	0.30	0.34	0.36	0.30

Table 4b. The Number of Low (L), Medium (M) and Highly (H) Educated Women Who Experienced Each Element of the Six Possible Pathways to First Birth by Country and Transition.

	S --> C			S --> M			S --> B			C --> CM			C --> B			M --> B			CM --> B			D --> B			D --> R			R --> B		
	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
Austria	7014	7223	810	2911	2459	242	81	63	3	3117	3561	443	2714	2555	197	2682	2304	206	2659	3059	369	1297	1058	69	1535	1460	187	583	843	105
Belgium	4288	3124	1936	2849	1976	992	186	93	30	2843	1999	1268	1095	834	464	2554	1786	880	2497	1768	1112	1510	775	337	749	607	321	457	388	167
Bulgaria	10969	9747	1651	5148	4223	807	354	237	42	8734	8483	1401	1913	925	110	5311	4060	743	8355	8071	1251	1420	1039	131	217	163	25	143	118	15
Estonia	7441	6727	1856	4450	4135	1181	258	195	54	3651	3439	907	3214	2683	661	4312	3957	1115	3414	3178	835	3075	2481	546	595	603	171	378	298	139
France	9095	7773	3535	4822	2918	933	216	120	21	3883	3842	1767	3938	2759	1049	4547	2757	857	3470	3412	1563	2594	1565	444	1241	1092	623	738	704	361
Italy	5926	4548	598	30315	16762	1786	192	81	9	2566	2072	248	2018	1121	161	26894	13908	1473	1955	1411	122	2460	1448	131	572	558	76	311	310	55
Lithuania	2760	2632	572	6038	5570	1090	267	183	30	1578	1608	380	949	830	122	5751	5276	968	1425	1425	282	1819	1592	249	147	142	27	80	84	8
Netherlands	7113	7350	1842	5614	3755	672	54	30	3	3997	4220	1052	1837	1448	264	5064	3164	546	3419	3605	897	1316	683	123	1275	1432	298	706	746	125
Norway	17597	8842	2760	9290	4040	1107	183	54	15	6660	3430	1252	8960	4085	1014	8755	3831	1031	5925	3167	1127	4261	1459	327	3852	2008	608	2865	1481	442
Romania	3632	2318	222	9405	6618	620	99	51	0	2130	1627	168	1343	557	18	8763	5960	474	1805	1324	103	1155	808	40	160	112	17	111	48	11
Russia	6558	6321	955	9013	8446	1052	462	330	72	3130	3193	505	3003	2643	278	8660	8032	936	2925	2951	407	3833	3244	380	605	707	112	342	481	55
Spain	4789	3008	1308	12221	5429	1773	177	72	18	2069	1355	640	1633	825	267	11136	4769	1464	1742	1065	480	1253	532	119	198	145	52	106	105	23
the UK	6095	6599	4785	4964	4864	2366	216	111	42	2063	2564	2321	2965	2749	1231	4496	4287	1927	1598	1898	1636	2299	2067	783	1076	1442	1008	675	851	567
United States	9555	7317	5886	6982	5260	3688	363	210	84	3267	3117	3178	4974	3128	1544	6058	4457	2842	2443	2372	2365	4553	3010	1393	1931	1876	1661	1006	1080	883

Table 5. Results of the Stratified Cox Regression, Hazard Ratios, Reference: Medium Education.

	S --> C				S --> M				S --> B				C --> CM				C --> D				C --> B			
	Low		High		Low		High		Low		High		Low		High		Low		High		Low		High	
Austria	0.819	**	1.294	*	1.125		1.932	**	1.253		0.354		0.838		1.193		1.108		1.125		0.876		0.551	*
Belgium	0.774	**	1.398	**	0.835	.	1.044		1.055		0.550	.	1.101		1.029		1.182		0.715		1.352		0.831	
Bulgaria	0.937		0.931		0.697	***	1.306	*	1.441	*	0.803		0.665	***	1.059		1.573		1.459		2.249	***	0.617	.
Estonia	1.068		0.954		0.704	***	1.240	*	1.333	.	1.036		0.882		1.231	.	1.246		1.094		1.105		0.669	**
France	0.777	***	1.173	*	1.169	.	0.957		1.403	*	0.355	**	0.841	*	0.870		1.063		0.949		1.414	***	0.707	**
Italy	1.051		1.179		1.347	***	1.092		2.238	***	0.841		0.877		1.055		0.667	**	1.371		1.870	***	1.504	
Lithuania	1.097		1.122		0.754	***	1.070		0.691	.	0.856		0.810		1.278		0.858		1.462		1.011		0.472	.
NL	0.940		1.178		1.353	***	0.825		2.673	**	0.302		1.123		0.887		0.975		0.993		2.233	***	0.699	
Norway	0.842	***	0.932		0.791	**	1.458	**	1.442	*	0.571	.	0.932		1.521	***	1.077		0.855		1.094		0.914	
Romania	1.366	***	0.773		0.952		1.071		1.518	*	0.000		0.553	***	1.538	.	0.940		3.714	*	1.225		0.199	
Russia	0.928		0.859		0.799	***	0.954		1.135		0.640	*	1.036		1.105		0.668		1.087		0.929		0.626	*
Spain	0.913		0.986		1.317	***	0.809	**	1.892	***	0.391	*	1.234	.	1.295	.	1.629		1.002		1.473	*	0.767	
the UK	0.783	**	1.081		0.982		0.940		1.587	***	0.406	***	0.945		0.999		0.841		1.010		0.974		0.537	***
US	0.908		0.850	*	0.958		0.925		1.203	.	0.405	***	0.872		1.343	**	0.929		1.313	*	1.674	***	0.571	***

	M --> D				M --> B				CM --> D				CM --> B			
	Low		High		Low		High		Low		High		Low		High	
Austria	1.047		0.883		0.695	*	0.707		2.214	*	0.772		0.881		1.057	
Belgium	3.444		0.870		0.913		0.952		0.796		0.685		0.995		1.243	.
Bulgaria	2.995	*	2.496		0.945		1.150		1.551		0.288		0.905	.	1.116	
Estonia	1.308		0.823		1.084		1.027		2.171	*	0.954		1.110		1.164	
France	1.501		1.838		0.835	*	1.132		3.867	***	2.294	*	1.120		1.123	
Italy	0.614	**	0.587		1.130	***	1.013		1.113		0.883		1.223	.	0.734	
Lithuania	2.246	*	1.455		1.091		1.044		1.672		0.695		0.968		0.911	
NL	0.864		0.856		1.191	*	0.990		1.211		0.625		0.911		0.872	
Norway	1.558		1.177		0.980		1.235	.	1.431		1.157		0.893		1.173	.
Romania	0.740		1.345		0.977		0.980		0.329		1.019		0.975		1.092	
Russia	0.824		0.441	*	1.071		1.129		1.391		0.807		0.999		1.145	
Spain	0.953		1.328		1.067		0.852	*	0.423		0.575		0.966		0.910	
the UK	1.025		0.910		1.188	.	0.964		0.671		1.131		1.320	.	1.028	
US	1.258		0.921		1.302	*	0.957		1.138		0.922		1.410	*	1.325	*

	D --> R				D --> B				R --> B			
	Low		High		Low		High		Low		High	
Austria	0.925		0.965		0.789		0.507		0.972		1.190	
Belgium	0.600	*	0.853		1.497		0.509		0.808		0.754	
Bulgaria	0.731		0.467		1.037		0.761		2.081		1.963	
Estonia	0.849		1.356		1.653		3.675	**	0.947		1.577	.
France	0.779		1.277		2.110	.	0.877		0.550	*	0.988	
Italy	0.980		1.187		0.864		0.379		0.991		1.028	
Lithuania	1.017		1.017		1.033		1.719		0.334		0.338	
NL	0.868		1.065		2.357	*	0.611		1.127		1.138	
Norway	0.843	.	1.079		1.323		1.099		1.053		1.207	
Romania	1.153		0.758		0.493		0.839		1.398		6.318	
Russia	0.941		0.670		0.900		0.957		0.834		1.020	
Spain	0.441	.	0.719		1.258		0.889		0.192	*	0.470	
the UK	0.919		0.862		2.434	*	1.431		1.226		0.961	
US	0.731	.	0.861		1.335		0.703		0.960		1.367	.

*Note: *p < .05. **p < .01. ***p < .001 . p<0.1*

Note: The analyses are controlled for birth cohort and educational enrolment

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