Later or never?

Partnership histories and motherhood in later reproductive ages in a comparative perspective

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Abstract

Using data from the Harmonized Histories, we study the influence of partnership histories on the probability of becoming a mother by age 40 in 10 European countries and the United States for women born in the 1960s. Using a multistate framework, we provide an innovative way to understand how different partnership histories at ages 30 and 35 shape childless women's probabilities of achieving motherhood by age 40. We find that in most countries childless women who experienced cohabitation before marriage by age 30 have the highest probability of achieving a first birth by age 40, followed by the directly married, the cohabiters and the never partnered. Childless 35-year-old women have lower probabilities than 30-year-old women to have a first birth by age 40, especially if they have never had a co-residential partner. Those who are in a union at age 35 have varying first birth probabilities depending on their partnership histories.

Introduction

Family life courses have changed considerably over the last few decades; some transitions have been delayed (e.g. transition to parenthood), some are happening earlier (e.g. age at first sexual debut) and new steps have emerged (e.g. non-marital cohabitation). Furthermore, the prevalence of union dissolution and divorce has increased. Consequently, life course patterns have become more diverse, the sequencing of life events has changed and the transition from youth to adulthood became less traditional and less predictable than in the past (Liefbroer, 1999).

While motherhood is being postponed to ever later ages, the biological age limit to female fecundity does not change. Fecundity declines with age (Heffner, 2004) and only a very limited group of women are able to benefit from medically assisted reproductive technologies (Schmidt, Sobotka, Bentzen, & Andersen, 2012). Additionally, the success rate of conception using these technologies also decreases as age increases (Leridon, 2004). Thus, changes in the structuring of family life courses might further enhance the postponement of motherhood and lead to increased uncertainty as to whether a woman will become a mother or to unwanted childlessness.

This study focuses on the role of partnership histories (i.e. the sequence of partnership events) on the probability of becoming a mother later in the reproductive ages for women born between 1960 and 1969. The following research questions are addressed: What are the probabilities of women to achieve a first birth by age 40 in Europe and the United States? How do these probabilities change for women who are still childless at ages 30 and 35 conditional on their partnership histories? Are there differences across Europe and the United States?

This paper contributes to the literature in several ways. First, previous studies mainly examined the timing of the first birth and its determinants (Heuveline & Timberlake, 2004;

Manning, 1995; S. P. Martin, 2000) and much less attention has been paid to the influence of previous partnership experiences on the transition to parenthood. Studies that did include some indicator of previous family life experiences, mainly evaluated whether individuals have ever cohabited, or have ever been married (for example Guzzo, 2006). However, this approach ignores the interrelationship between different union events, as suggested by life course theory (Elder, 1977, 1992; Giele & Elder, 1998; van Wissen & Dykstra, 1999). To address this shortcoming, this paper emphasises the role of partnership histories, defined as the sequence of previous union events, in the transition to parenthood. Studying partnership histories as opposed to single events enables us to model the whole family life course rather than just one specific segment of it.

Second, studies that take a life course perspective have either investigated several transitions simultaneously by applying simultaneous equations (an event-based approach) (for example Baizán, Aassve, & Billari, 2003, 2004; Steele, Kallis, Goldstein, & Joshi, 2005) or studied life course patterns using sequence analysis (a holistic approach) (for example Aassve, Billari, & Piccarreta, 2007; Billari, 2001; Billari & Piccarreta, 2005; Robette, 2010). Although these methods account for the possible interrelationship between different union events, they cannot reveal the dynamic nature of the union and family formation process at the individual level. To do so, I use an extended version of non-parametric multistate models. This technique combines the properties of the above approaches by being able to account for the role of entire union histories at several distinct ages when studying the probability of a first birth by age 40.

Third, although much is known about the determinants of partnership formation and the transition to parenthood, to the knowledge of the author, there are no descriptive studies focusing on the actual levels of first birth probabilities by previous partnership histories either during the whole reproductive life span or at later reproductive ages. This is surprising given

the extensive literature on first birth timing and postponement as well as on partnership experiences and first birth timing.

Last, due to cultural and institutional differences, the organisation of life courses may differ between countries (Billari & Liefbroer, 2010). By studying this topic in a cross-national perspective, this study will contribute to the understanding of cross-national differences in family life courses.

To sum up, studying the influence of entire partnership histories on the probability of becoming a mother late in the reproductive years using a multistate framework provides an innovative approach to understand how changing family life courses shape women's chances to become a mother or, alternatively, remain childless.

Theoretical Background

This section sets out the different elements of the relationship between partnership histories and the transition to parenthood in a comparative perspective. After relating changes in partnerships to unwanted childlessness via postponement, previous findings on how different union events influence the transition to parenthood are summarised. Then, I suggest a theoretical shift from studying the role of partnership events in the transition to parenthood to examining entire partnership histories. Last, the theoretical model is described.

This study takes a comparative perspective. I expect that the different country-specific social policies, welfare systems, the varying levels of gender equity, and the legal status of children born outside of a marriage play a role in the timing and probability of the transition to parenthood (G. E. Andersen, 1990; Goldstein, Sobotka, & Jasilioniene, 2009). Five groups of countries are distinguished based on their common socio-economic and political experiences: 1) the United States, 2) Central and Eastern Europe (Estonia, Bulgaria, and

Russia), 3) Northern Europe (Norway), 4) Southern Europe (Spain) and 5) Western Europe (Austria, Belgium, France, the Netherlands, and the UK).

Fertility Postponement and Partnership Events

In the last four or five decades, the transition to motherhood has been delayed; the mean age of mothers at the birth of their first child (i.e. timing of the first birth) has been increasing by approximately one year per decade in all European countries (Mills, Rindfuss, McDonald, & te Velde, 2011) and in the United States (Sobotka, Zeman, Lesthaeghe, Frejka, & Neels, 2011). By 2010, it varied between 27 in Bulgaria and 31.3 in Italy and Switzerland (EUROSTAT, 2010) and it was just over 25 in the United States (J. A. Martin et al., 2012).

The onset of the fertility postponement differed between countries. In the United States and in Western and Northern Europe, women born as early as the 1940s already started to delay having a first child while in Southern Europe, the postponement only began a decade later. In Central and Eastern Europe, this process started within the 1960s birth cohorts (Frejka, 2008; Frejka & Sardon, 2007).

This 'postponement transition' (Kohler, Billari, & Ortega, 2002) has demographic, biological, and medical consequences. For example, the proportion of births to older mothers has increased considerably (Billari et al., 2011; Heffner, 2004). In the EU, the share of mothers over age 40 has risen from 1.6% in 1980 to 3% in 2006 (Sobotka, Billari, & Kohler, 2010). Several medical studies showed that as women get older their fecundity declines and the time to conception as well as the risk of a spontaneous abortion increases (Leridon, 2004; Schmidt, 2010). Men also experience decreased fecundity as they age (Schmidt, 2010). Therefore, when trying for a first child is delayed to late or very late ages, there might be little time left for catching up (Kohler et al., 2002) and medically assisted technologies cannot fully compensate for the rising infecundity caused by the postponement of motherhood (de

Jong & Steenhof, 2000). Therefore, the postponement of first births might lead to unwanted childlessness. Furthermore, the medical consequences of advanced maternal and paternal age are well known; just to mention a few examples, high risk of stillbirths, increased risk of breast cancer for women, lower semen quality for men, or risk of birth defects (Sartorius & Nieschlag, 2010; Yang et al., 2007).

The postponement of parenthood is usually explained by economic, societal and cultural changes. For example, the rise in female labour force participation (Wilkie, 1981) and wages increased women's opportunity costs of having children (S. P. Martin, 2000). At the same time, they had better educational opportunities (Rindfuss, Bumpass, & John, 1980). Increasing female educational enrolment implied a later labour market entry and thus a postponed household and union formation. This, in turn, led to the postponement of first births (Kohler et al., 2002). Additionally, the introduction of effective contraceptives, value changes, gender equity, housing conditions, economic uncertainty, absence of supportive family policies and changes in partnerships are also mentioned as explanations for the postponement of first births (Mills et al., 2011). This study focuses on the latter aspect.

Changes in partnerships influence the postponement of parenthood directly (in this paper, partnership refers to a co-residential partnership). For example, the increased prevalence of non-marital cohabitation means later entry to marriage (if not completely forgone), which results in delayed first births (Balbo, Billari, & Mills, 2013; Manning, 1995). At the same time, cohabiting and marital unions are less stable, wherefore more and more people experience multiple partnerships before settling down with one partner (Wu & Schimmele, 2005). Difficulties in finding a suitable partner might further contribute to delays in childbearing (Billari, Kohler, Andersson, & Lundström, 2007; Mills et al., 2011). The longer it takes to find an appropriate partner, the more likely it is that delayed childbearing will result in unwanted childlessness.

I do not claim that partnership experiences have a causal relationship with fertility. As shown by previous studies, there are many other characteristics that influence fertility which are also correlated with partnership experiences. Furthermore, the relationship could also be reversed: fertility might influence partnerships. For example, disagreement about having children might lead to union dissolution. This paper does not aim at establishing the direction of a possible causal relationship. But by examining the influence of partnership experiences on fertility I wish to contribute to the understanding of the role that the increasing reality of postponement plays in remaining childless.

Partnership Events and Parenthood

Partnerships can be seen as an 'intermediate determinant' (Bongaarts, 1978) of fertility: partnership status is directly related to achieving fertility. Being in a union means exposure to regular sexual intercourse (Bongaarts, 1978). Additionally, women are more motivated to raise their child within a relatively stable setting than outside of a union (Hobcraft & Kiernan, 2001; Philipov, Spéder, & Billari, 2006). Cohabitations are generally less stable than marriages (Heuveline & Timberlake, 2004; Liefbroer & Dourleijn, 2006) and children are more likely to be born within marriage than in cohabitation (Baizán et al., 2003, 2004; Brien, Lillard, & Waite, 1999; Kiernan, 2004; Manning, 1995). The prevalence of pre-marital cohabitation and its relationship with childbearing varies across countries (Heuveline & Timberlake, 2004). For example, in Southern Europe, non-marital cohabitation and non-marital childbearing are rare (Kiernan, 2004) and the transition to parenthood is very closely linked to union formation and marriage (Heuveline & Timberlake, 2004; Kohler et al., 2002). In Eastern Europe, the prevalence of non-marital cohabitation is also very low but at the same time the level of non-marital fertility is high, especially among single mothers. These women usually marry shortly after conception (Lesthaeghe & Moors, 2000; Perelli-Harris & Gerber,

2011; Perelli-Harris et al., 2012). There is much more variation in the levels of cohabiting conceptions across Western and Northern European countries. While in Norway and France these levels are very high (around 50% of all conceptions took place within cohabitation between 1995 and 2004), in Austria and the Netherlands, this proportion is around 25% (Heuveline & Timberlake, 2004; Perelli-Harris et al., 2012). The UK and the US are not only characterised by high proportions of non-marital conceptions but also by high levels of conceptions to single mothers (Perelli-Harris et al., 2012; Seltzer, 2004).

To summarise, as the meaning and prevalence of different union experiences varies across countries, I expect cross-national differences in the role of partnership experiences in the transition to parenthood.

From Partnership Events to Partnership Histories

It is not just the presence of a partner and the type of union that is of importance when studying the influence of partnerships on fertility. Life courses became increasingly diverse in the last few decades and the dynamics of partnerships has changed. These changes have been linked to the postponement of parenthood (Balbo et al., 2013). In order to understand how partnership experiences form people's probabilities to postpone childbearing until an age when they are unable to have children and thus remain childless, one needs to examine the entire history of these partnership experiences.

This is also essential because intermediate events may alter the outcomes of later events. This argument is in line with the life course approach, which suggests that events which happen earlier in the life course affect those that occur later in the life course (Elder, 1975, 1977, 1992; Giele & Elder, 1998). Additionally, it is important to realise that events in the family-life domain are interrelated; the timing and occurrence of an event influences that of a following event.

Previous research has examined the role of partnership status or previous partnership experiences on several life course transitions. Most studies focused solely on one segment of the life course by examining single or competing transitions. For example, they looked at the transition from marriage to parenthood (for example Baizán et al., 2003, 2004) or from marriage to separation (Berrington & Diamond, 1999). Berrington (2001) investigated the competing events of marriage, separation, or parenthood as the outcome of a cohabiting partnership. Some accounted for previous partnership experiences by specifying whether individuals have ever experienced cohabitation, marriage, or union dissolution (Guzzo, 2006; Heuveline & Timberlake, 2004; Manning, 1995; Steele et al., 2005). These studies focused solely on one segment of the family life course. However, to be able to follow the pathways through which women arrive at remaining childless, we need to examine the role of entire partnership *histories* in the transition to parenthood.

Therefore, I suggest a theoretical shift from focusing on single partnership events or experiences to focusing on partnership *histories* when studying the probability of a first birth. Building on this, I argue that it is not only the occurrence or non-occurrence of partnership events (i.e. cohabitation, marriage, dissolution of a cohabiting union, divorce, or re-partnering) which may influence later life course events, but also the order in which these events happen (i.e. sequencing). Our theoretical framework is shown in Figure 1. Women usually start forming co-residential partnerships after age 15. As time passes, first partnerships are formed, which can be marital (M) or non-marital (cohabiting – C) unions, but individuals can also remain never partnered (S). First partnerships may, then, be terminated by a union dissolution or divorce (D) and also, new partnerships may form (re-partnering – R). Note that our framework does not differentiate between cohabitation and marriage as a form of re-partnering due to data sparseness. Women might have a first birth (B) between age 15 and 40, or stay childless. Our model keeps track of the partnership histories of individuals, as

indicated by the sequences of capital letters. For example, the sequence SCMB refers to an individual, who was first never partnered, then cohabited with a partner whom she ended up marrying and had a child within this union. As I am interested to see how partnership histories influence the probability of achieving motherhood later in the reproductive ages, I study women who did not experience a birth by age 30 or 35. They can, then, either make the transition to parenthood by age 40, or remain childless.

Key Ages and Age Norms

This study focuses on women who are childless at the 'key ages' of 30 and 35 for a number of reasons. First, at these 'key ages', most transitions have already happened (Fussel & Furstenberg Jr., 2005) and these ages have been argued to represent significant milestones in the life cycle (Rindfuss & Bumpass, 1976).

Second, age 30 and 35 are seen as critical ages in terms of female fecundity. While at age 30 approximately 91% of childless women achieve pregnancy without artificial reproductive technologies (ART), 3% with ART and 6% remain childless, at age 35 these proportions are 57%, 7% and 36%, respectively (Leridon, 2004). Thus, there is substantial uncertainty about the feasibility of childbearing after age 35, especially for first births (Billari et al., 2007). I decided to examine a period before and after the onset of this uncertainty to be able to compare the influence of partnership histories on the probabilities of childlessness at both ages.

Third, the age patterns of childbearing vary considerably across countries. In Central and Eastern Europe, the pattern of childbearing is relatively young (Kohler et al., 2002) wherefore age 30 is seen as a relatively "old" age to begin childbearing. In the other European countries and the United States, women are much older when they first become mothers and thus age 30 might be perceived as "on-time" or maybe even "early".

Research suggests that certain "age norms" or "social deadlines" (Settersten, 2003) prescribe when it is "too early", "normal", or "too late" to engage in certain life course transitions. Some argue that the role of age in these transitions is relative to peer experiences, idealised life cycles and the expectations of friends and of other important persons (Rindfuss & Bumpass, 1976). Thus, whether and when men and women become parents may be influenced by these social deadlines. For example, using the European Social Survey, Mills et al. (2011) found that in 20 out of 23 European countries, age 40 was defined as the latest age for becoming a parent. Using the same data, Billari et al. (2011) found that respondents report a mean age of 41.7 for women and 45 for men as a deadline, above which they are too old to become parents. These reported ages are quite high (especially for women) and might indicate that people are usually not aware of the biological limitations over age (Billari et al., 2011; Mills et al., 2011; Schmidt, 2010).

This study focuses on the 1960-1969 birth cohorts. Taking a cohort approach is in line with life course theory because it enables us to follow events as they evolve over time and that occurred to a group of people who experienced the same period and cohort effects (Sobotka et al., 2011). Furthermore, in order to be able to draw conclusions about whether women who are still childless at ages 30 and 35 will achieve motherhood by age 40, we need completed fertility information. Age 40 is used as the end of reproductive ages because the probability of women experiencing a first birth above this age has shown to be quite small (Billari et al., 2007). Additionally, studying younger cohorts provide more information about current fertility trends and such cohorts are also more likely to have experienced more diverse partnership histories than earlier birth cohorts.

Data, Methods and Models

The *Harmonized Histories* is a comparative harmonised database of extensive retrospective union and fertility histories from 15 European countries and the United States (Perelli-Harris, Kreyenfeld, & Kubisch, 2010). This paper compares 10 European countries (Austria, Belgium, Bulgaria, Estonia, France, the Netherlands, Norway, Russia, Spain, and the UK) and the United States. For most European countries, data are from the first wave of the Generations and Gender Surveys (from various years between 2004 and 2010), the British data come from the British Household Panel Survey (2005-2006), the Spanish data were collected as part of the Spanish Fertility Survey (2006), the Dutch data come from the 2003 Fertility and Family Survey, and data for the United States are taken from the National Survey of Family Growth (2007). Although most datasets include retrospective information for men, the present analyses are restricted to women as it has been shown that men underreport their fertility histories, especially in case of non-marital births and of births from previous marriages (Rendall, Clarke, Peters, Ranjit, & Verropoulou, 1999). The sample consists of heterosexual women born between 1960 and 1969 who are childless and never partnered at age 15.

To answer the research questions, first an extended version of a non-parametric multistate model is fitted with a separate baseline for each transition. Women are observed from age 15 to 40 and their first birth probabilities are estimated. I also examine how these probabilities vary by different partnership histories. Then, this multistate model is re-fitted to calculate the transition probabilities to first birth by age 40 for women who are still childless at ages 30 and 35 considering their different partnership histories up to these ages.

Multistate models assume the Markov property which means that the present behaviour of an individual is enough to predict its future behaviour (P. K. Andersen & Keiding, 2002; Hougaard, 1999). More precisely, when, for example, calculating the probability of experiencing a birth within a marital union, this approach would not

differentiate between direct marriages and marriages which were preceded by non-marital cohabitation. As I expect the probability of a first birth to differ by previous partnership histories, this assumption is not realistic. Therefore, I propose an extension to the model, where the states are sequences of previous partnership experiences as compared to single events in the original approach.

Figure 2 shows the extended multistate model; the rectangular boxes depict states that an individual can occupy during the family life course and the arrows represent the possible movements (i.e. transitions) between these states. For example, the state SCMDRB refers to the sequence of the following states: never partnered and childless (S), cohabitation (C), marriage (M), union dissolution (D), re-partnering (R), and first birth (B). Note that union dissolution refers to both the dissolution of a marital and a cohabiting union and re-partnering refers to the formation of both a new cohabitation and marriage. As I am interested to see how previous partnership histories influence the probability of a first birth, the analyses will focus on those states which involve the occurrence of a birth (marked with grey).

The same model is estimated for all countries to ensure cross-national comparability of the results. In case one or more of the states are empty (i.e. no one has experienced the given series of events in a particular country), transition probabilities cannot be estimated. To keep the comparability of the models, in these cases a so called "imaginary individual" is created by imputing average times to events. This only happens rarely; the empty states are SMDRB in Belgium, SCDB and SCMDB in Spain, and SMDB in Norway. Furthermore, the number of women who become mothers after having experienced a union dissolution, re-partnering or both (i.e. SCDB, SMDB, SCDRB, SMDRB, SCMDB, SCMDRB) is extremely small in most countries. As one of the main objectives of this paper is to compare the results across countries, I decided to only show the results for those states that are visited by at least 5% of the observations in each country to arrive at reliable estimates of the transition

probabilities. Therefore, detailed discussion of the results will only include the following states: SB, SCB, SMB, and SCMB. This also implies that the creation of these "imaginary individuals" will not have an impact on the results while it enables us to fit comparable models across countries. Additionally, although results for these more complicated states are not reported, it is necessary to estimate the full model in order to avoid an underestimation of the transition probabilities to first birth.

The multistate models are estimated using the *mstate* package in *R*, developed by Putter and colleagues (de Wreede, Fiocco, & Putter, 2011; Putter, 2011; Putter, Fiocco, & Geskus, 2007).

Results

The results are structured as follows. I first present some descriptive results to describe the main characteristics of the data. Then, using the extended multistate model, I estimate the probabilities of women to achieve a first birth by age 30, 35, and 40 to show cross-national differences in the timing of first births. The birth probabilities at age 40 will also be shown by partnership experiences. Last, by re-fitting this multistate model, I calculate the first birth probabilities of women who are still childless at ages 30 and 35 by partnership histories.

Descriptive Results

Table 1 summarises the number of women who are at risk of each transition (SB, SCB, SMB and SCMB) and the number of those who experience them. Women in this table are observed from age 15, when they are all childless and never partnered, until age 40. Sample sizes vary considerably between 577 for Belgium and 1,630 for Bulgaria. Note that the total sample size for each country equals the number of men and women who are at risk of the transition SB.

Also note that the sum of the number of events does not equal the total sample size, as some individuals do not experience a birth.

From the information provided in Table 1, the proportion of those who experienced a birth within each state can be calculated. Between 75% and 96% of women who are directly married experience a birth by age 40 (SMB) (Figure 3). This proportion is closely followed by women who experience a birth within a marital union which was preceded by non-marital cohabitation (SCMB). The proportion of births within direct marriage and a marriage that was preceded by pre-marital cohabitation are similar in most countries but there are somewhat bigger differences between them in Belgium, Austria, Russia, and Spain. The order of these proportions is reversed in France, and there are no or very small differences between them in Bulgaria and Norway. Additionally, on average, 10-30% of women in a non-marital cohabitation give birth within such a union although this proportion is somewhat higher in Norway (40%) than in the other countries. In most countries, this proportion is much lower than the proportion of women who have a birth within direct marriage or within marriage that was preceded by cohabitation. Last, in all countries, the smallest share (around 2-14%) of births belongs to women who have never had a co-residential partner by age 40.

The Probability of a First Birth and its Timing

Figure 4 depicts the probability of women to achieve a first birth by ages 30, 35 and 40 in each country given that they were childless and never partnered at age 15. These results come from an extended multistate model where women's probabilities of experiencing a birth between age 15 and 40 are estimated. First of all, women in Central and Eastern Europe (Estonia, Bulgaria, and Russia) seem to have achieved most of the births by age 30, as the differences between the blue and green bars are quite small (around 6 percentage points), especially compared to the other countries, where there are much larger differences in the

probability of having achieved a birth by ages 30 and 40. This difference is the greatest in the Netherlands, around 28 percentage points, whereas it is about 15-22 percentage points for the other Western and Northern European countries, and 20 percentage points for the US. In Southern Europe, represented by Spain, this difference is close to 23 percentage points. Although we see considerable differences between the probability of a first birth by age 30 and 35, it seems that by age 35, most women have achieved motherhood.

The difference between the height of the green bars and 100% indicates the proportion of women who remained childless up to age 40. This proportion ranges between 7% and 8% in Central and Eastern Europe and between 11% and 17% in Western and Northern Europe. Additionally, it is 22% in the US and 14% in Spain.

The Probability of a First Birth by Age and Partnership Histories

Figure 5 shows women's probabilities to achieve a first birth by age 40 conditional on their partnership histories for all countries. The state "other" refers to the sum of the probabilities of achieving a first birth by age 40 within those states, where no sufficient number of observations were available for a more detailed analysis (i.e. SCDB, SMDB, SCDRB, SMDRB, SCMDB, SCMDRB). Again, these women were all childless and never partnered at age 15. Note that summing up these partnership history-specific probabilities result in the same total probabilities of achieving a birth by age 40 as the ones indicated by the green bars in Figure 4. The probability of achieving a first birth by age 40 within direct marriage (SMB) is the highest among Spanish and Russian women (57-66%). Additionally, in Estonia, the UK, and the US, most births (around 30%) happen to women within direct marriage. In Bulgaria, France, Austria, and the Netherlands, the highest probability (between 31% and 47%) of a first birth belongs to a marital union which was preceded by cohabitation (SCMB). In Belgium, the probability of a first birth within direct marriage and within a marital union that

was preceded by cohabitation is very similar. The only country where the proportion of first births within a cohabiting union (SCB) is greater than for a marital birth is Norway (around 30%). Furthermore, this proportion is around 17-23% in France, Austria, and Estonia. In all other countries, it is between 5 and 7%. The probability of a single birth is the highest in the UK and the US, around 14%, while it varies between 2-9% in the other countries. The probability of a first birth within the other states (category "other") is the highest in Norway, the US, and the UK, suggesting that partnership histories, within which first births occur, are the most diverse in these countries among women born between 1960 and 1969.

Probability of a first birth of childless women at age 30 and 35 by partnership history

Next, we turn our attention to examining the probabilities of achieving a first birth by age 40 for women who were still childless at ages 30 and 35, conditional on their partnership histories. We do this by re-fitting the previously analysed multistate model to account for women's partnership histories at age 30 and 35.

When examining women's probabilities of becoming a mother by age 40 conditional on their partnership histories at age 30, a general pattern seems to emerge in all countries except Estonia, Bulgaria, and Russia (Figure 6). Women who are married at age 30 have the highest probability (70-87%) of achieving a birth by age 40. Those who also experienced pre-marital cohabitation have slightly higher (1-6 percentage points) probabilities than those who experienced direct marriage in Belgium, the UK, the US, the Netherlands, and Spain, whilst in France, Austria, Russia, and Norway, women who married following a pre-marital cohabitation have 11-15 percentage points greater probability to become a mother by age 40 than those who married directly. Women who are cohabiting at age 30, are 7-20% less likely to achieve parenthood by age 40 than their married counterparts. Additionally, women who

are still single at age 30 are the least likely to experience the transition to first birth by age 40; their probabilities vary between 22% in France and 40% in Spain.

The probabilities of women in Estonia, Bulgaria, and Russia do not follow these general patterns. In Bulgaria, the order of the probabilities belonging to direct marriage and marriage with premarital cohabitation are reversed; women who experienced direct marriage by age 30 are the most likely to achieve a first birth by age 40. In Estonia, women who cohabit at age 30 have the highest probability of achieving a first birth by age 40. This is closely followed by the probability of those who are in a marital union which was preceded by cohabitation and by those who experienced direct marriage. In Russia, women who married following pre-marital cohabitation by age 30 have the highest probability to achieve a first birth by age 40, followed by those who cohabit and the directly married. Similarly to what has been found for the other countries, in these countries, the lowest probability of giving birth by age 40 belongs to women who have not yet had a partner by age 30.

There is far more cross-country variation in the patterns of the transition probabilities to first birth conditional on women's partnership histories at age 35 than at age 30. In general, the probability of a first birth is much lower at age 35 than at age 30 in all countries. While women were 60-85% likely to experience a first birth depending on their partnership histories at age 30, at age 35, this probability is only between 25% and 60%. In the UK, the US, and Spain, the pattern is similar to what we saw when examining first birth probabilities conditional on partnership histories at age 30. In these countries, the highest probability of achieving a first birth by age 40 belongs to women who experienced a marriage that was preceded by non-marital cohabitation (between 40% and 60%), followed by those who married directly, those in a cohabiting union and those who have not had a partner by age 35. The pattern is similar in the Netherlands, although the order of the probabilities belonging to direct marriage and marriage which was preceded by cohabitation is reversed. Additionally,

in Bulgaria and Norway, the probability of a cohabiting first birth is even higher than that of a first birth within direct marriage. The same holds for Russia and Estonia, where women in a non-marital cohabitation have the highest first birth probabilities by age 40, but the second highest probability belongs to those whose marriage was preceded by cohabitation rather than to those who were directly married. Again, women who were never partnered at age 35, have the smallest chance of becoming mothers by age 40. Whereas this probability was between 22% and 40% at age 30, by age 35 it is below 10% for all countries except Estonia, where it is just below 19%.

Summary and Conclusions

Although we have ample knowledge about single life course transitions, and as such, about the transition to parenthood, much less attention has been paid to studying how events that happen early in the life course affect later events, as suggested by life course theory. The present study aimed to contribute to the life course literature by addressing the influence of partnership histories on the transition to motherhood later in the reproductive ages in a comparative perspective. We proposed a theoretical shift from focusing on the experience of single events (e.g. cohabitation, marriage, or separation) to studying the influence of entire partnership histories on the probability of a first birth.

The descriptive results showed that among women born between 1960 and 1969, having a first child at age 30 seems to have been quite "late" in Central and Eastern Europe, as indicated by the high proportion of first births to 30-year-old women. On the contrary, in Northern and Western Europe and in the US, women might have been considered to be "too young" or "on time" to start a family at this age. This finding is in line with previous studies that examined the timing of first births across several countries and found an East-West divide (Hajnal, 1965). It is important to mention that while women born between 1960 and

1969 experienced the same period and cohort effects within each country, the experiences of these cohorts varied across countries. For example, the availability of effective contraceptives varied among countries as did the levels of female educational enrolment and labour force participation. Also, these cohorts were in different phases of the postponement transition. This implies that the cross-country differences in the results might be due to these cross-cohort differences rather than due to actual country specificities. Perhaps comparing different cohorts across countries that were approximately at the same stage of these developments would lead to different results. Last, the levels of childlessness were found to be very similar to those estimated by previous cohort studies (Frejka, 2008; Frejka & Sardon, 2007).

This study used an innovative analytic approach to answer the research questions. The first set of analyses applied an extended multistate model to examine the probability of a first birth between age 15 and 40. These probabilities were also studied by partnership histories. The probability of a first birth between age 15 and 40 was the highest within direct marriage in Russia and Spain, while in Austria, Bulgaria, France, and the Netherlands, the highest probability belonged to women who were in a marital union that was preceded by cohabitation. This suggests that, indeed, there are differences in first birth probabilities by partnership histories.

The second set of analyses re-calculated these probabilities to examine the impact of different partnership histories on the probability of a first birth for women who are still childless at ages 30 and 35. Overall, women who are still childless at age 30 had a 60-90% chance to achieve a first birth within the next 10 years, depending on their partnership histories. A general pattern seemed to emerge for these women in all countries except Central and Eastern Europe; the probability of a first birth was the highest for women who were in a marital union which was preceded by cohabitation. Women who directly married had the second highest probability, followed by those who were cohabiting. These three types of

partnership histories represent the 'partnered' states. The probability of a first birth for never partnered women at age 30 was considerably smaller (20-40%) than in any of these 'partnered' states. These findings suggest that while childless 30-year-old women are quite likely to achieve motherhood by the end of their reproductive years, their probabilities vary depending on their partnership histories.

Women, who were still childless at age 35 had much lower probabilities to achieve a first birth by age 40 (25-60%) than women who were five years younger. When examining the influence of partnership histories on this probability, the results were more diverse than for 30-year-old childless women. Only the UK, the US, and Spain followed similar patterns to what we saw among childless women at age 30. Thus, in these countries, childless women at age 35 had a smaller probability to achieve a first birth by age 40 than 30-year-old women; the probabilities are smaller for all partnership histories. This result might indicate that in these countries, the role of partnership histories on the probability of a first birth does not change much over age for childless women. At both ages, women who experienced pre-marital cohabitation and marriage had the highest probability to achieve a first birth by age 40, followed by the directly married, the cohabiting and the never partnered. In Estonia, Bulgaria, Russia, and Norway, the probability of a first birth by age 40 was the highest for women who lived in a non-marital union at age 35. This suggests that cohabiting unions have an increased importance for childless women at age 35 in these countries. Additionally, we found the same gap between the 'partnered' and unpartnered states in all countries at age 35 as at age 30. Women who have never had a co-residential partner by age 35 had less than 10% chance to have a first child within the next 5 years in all countries, except Estonia. This result is in line with the argument that that having a partner is very important as women in a union are exposed to more regular sex than those who do not have a co-residential partner (Bongaarts, 1978). Furthermore, this indicates that childless and never partnered women at

age 30 are still quite likely to achieve a first birth by the end of their reproductive years while this chance is considerably smaller for women who are childless and never partnered at age 35.

To sum up, these results show that childless women's probabilities to achieve a first birth at later reproductive ages depend on their partnership histories. This corroborates the theoretical approach emphasised in this paper according to which it is essential to focus on partnership histories, rather than simply examine the occurrence of previous events, to be able to understand how women's opportunities are shaped by changing family life courses. This is especially the case for age 35, where partnership histories seem to matter even more than at age 30.

Although this study has contributed to the life course literature in several ways, a few limitations have to be mentioned. First, even though the data are suitable for the purpose of a cross-national comparison and include extensive fertility and union histories, data sparseness did not allow for examining more complicated pathways. Second, this study is strictly descriptive, and does not account for individual heterogeneity. Third, women who are still childless at ages 30 or 35 are a very selective group. This would not necessarily be a limitation concerning our research questions. However, due to differences in the timing of first births across countries, most probably the sample is more selective in some countries than in some others. To improve upon these limitations, future research could extend the present study by using a large cohort dataset and examining the effect of individual characteristics on first birth probabilities while still accounting for partnership histories.

Nonetheless, our study is the first to point out how partnership histories shape women's opportunities, who are still childless at age 30 and 35, to become a mother by age 40. Biological studies concluded that childless women at age 30 still have a reasonable chance to achieve parenthood whereas women at age 35 should be concerned about perhaps

remaining childless. Our study has shown that these probabilities clearly depend on partnership histories. Women who have never had a partner by age 35 should be the most concerned, while those who have a partner still have a 25-60% chance of achieving motherhood by age 40 depending on their partnership histories. The role of partnership histories was found to be more important at age 35 than at age 30 for childless women.

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Table 1. Number of women at risk of the events SB, SCB, SMB, and SCMB, and the number of women experiencing these events, women observed from age 15 being childless and never partnered at this age, by country.

		SB	SCB	SMB	SCMB
EST	at risk	863	446	312	273
	event	72	145	291	252
BUL	at risk	1630	901	561	795
	event	77	88	540	765
BE	at risk	577	303	211	226
	event	47	39	195	188
FR	at risk	1039	732	184	355
	event	64	237	166	326
AUT	at risk	855	594	144	326
	event	80	148	129	272
UK	at risk	1025	471	357	258
	event	142	80	292	204
US	at risk	1395	586	522	323
	event	196	108	391	230
RUS	at risk	1175	323	717	203
	event	99	89	674	181
NOR	at risk	1476	1098	214	409
	event	112	433	191	366
NL	at risk	1032	633	337	427
	event	22	77	306	378
ESP	at risk	1529	267	1089	156
	event	78	68	1011	135

Figure 1. Theoretical Model

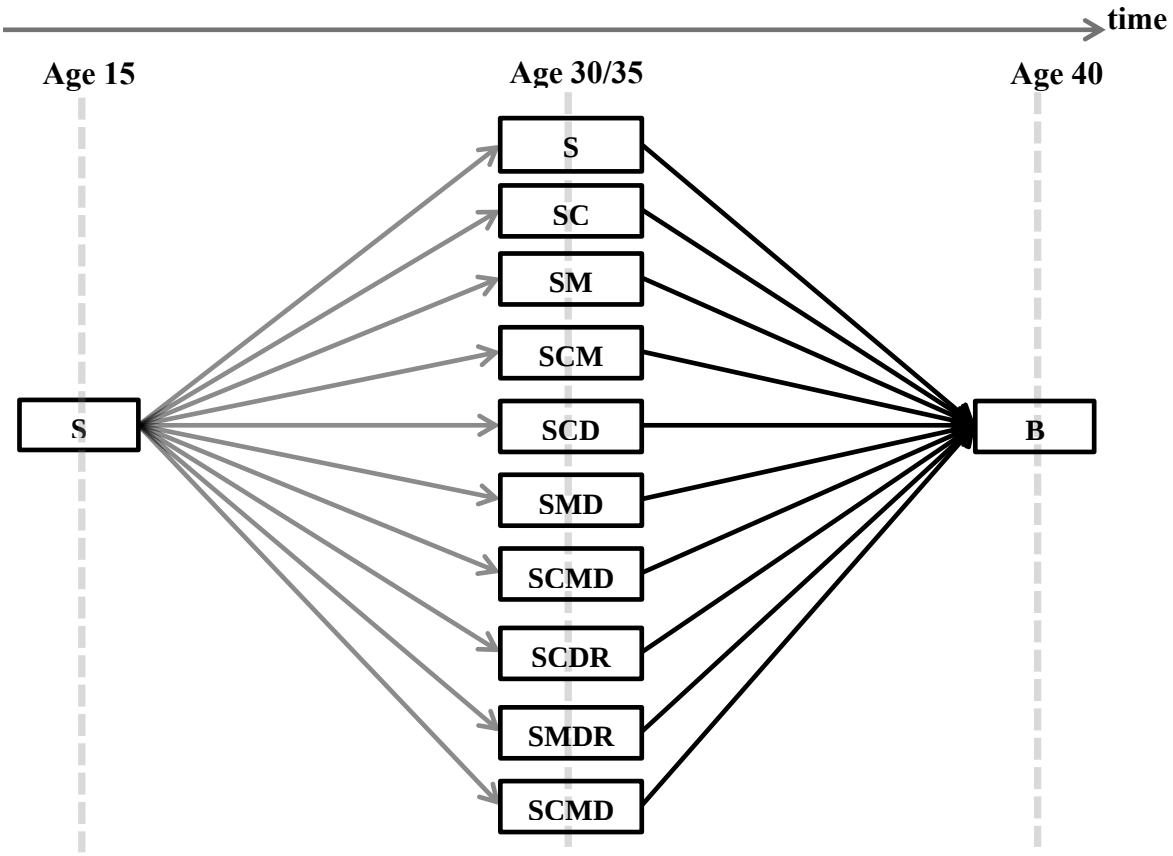

Figure 2. Extended multistate event history model for studying the influence of partnership histories at age 30 and 35 on the probability of a first birth by age 40.

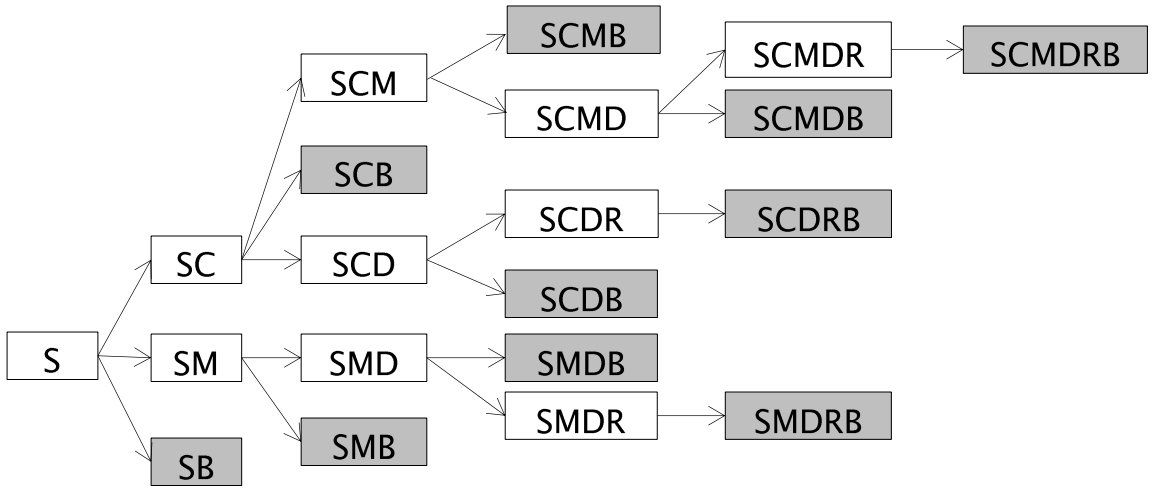

Figure 3. Descriptive Results. Proportion of women experiencing a transition to first birth by age 40 by partnership history and country, observed from age 15 being childless and never partnered at this age.

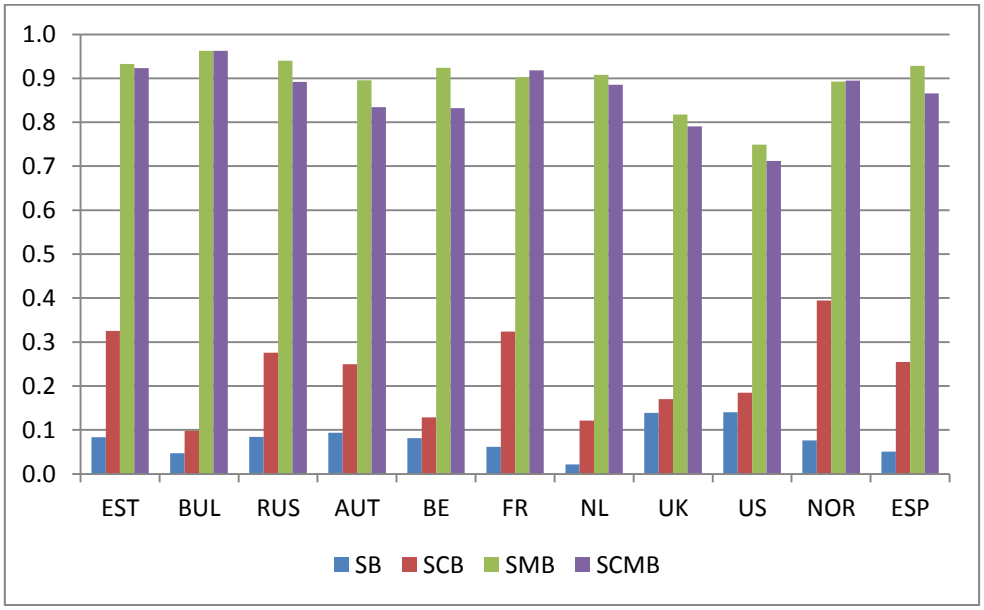

Figure 4. Probability of women to achieve a first birth by age 30, 35 and 40 given that they were childless and never partnered at age 15, by country.

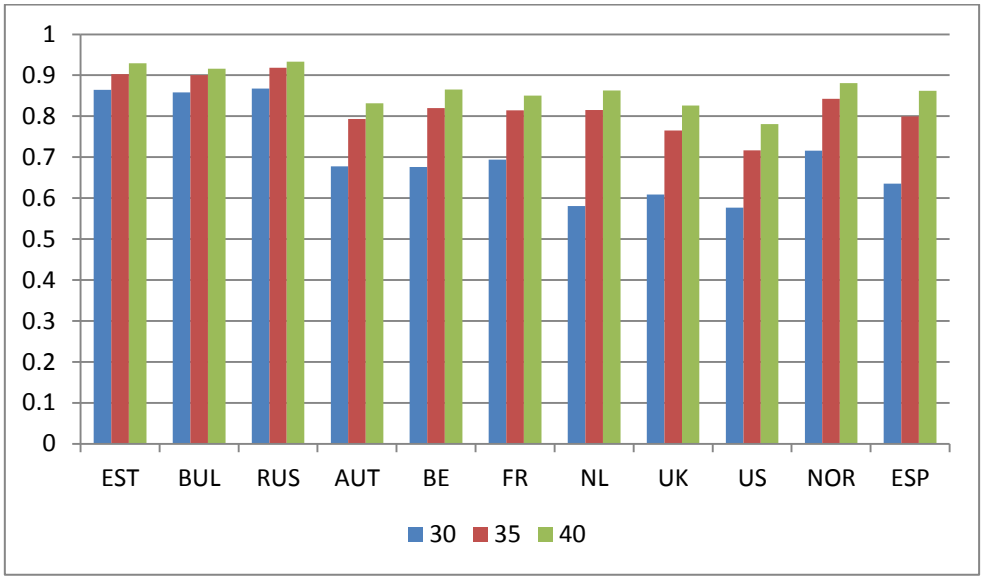

Figure 5. Probability of women to achieve a first birth by age 40 by partnership history at this age, by country.

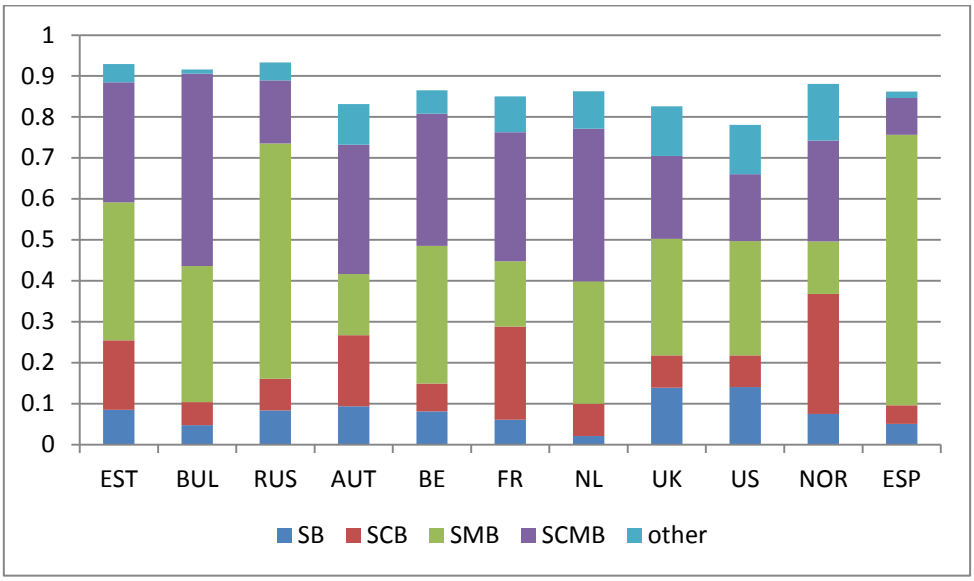

Figure 6. Probability of women to achieve a first birth by age 40 given partnership histories at age 30, by country.

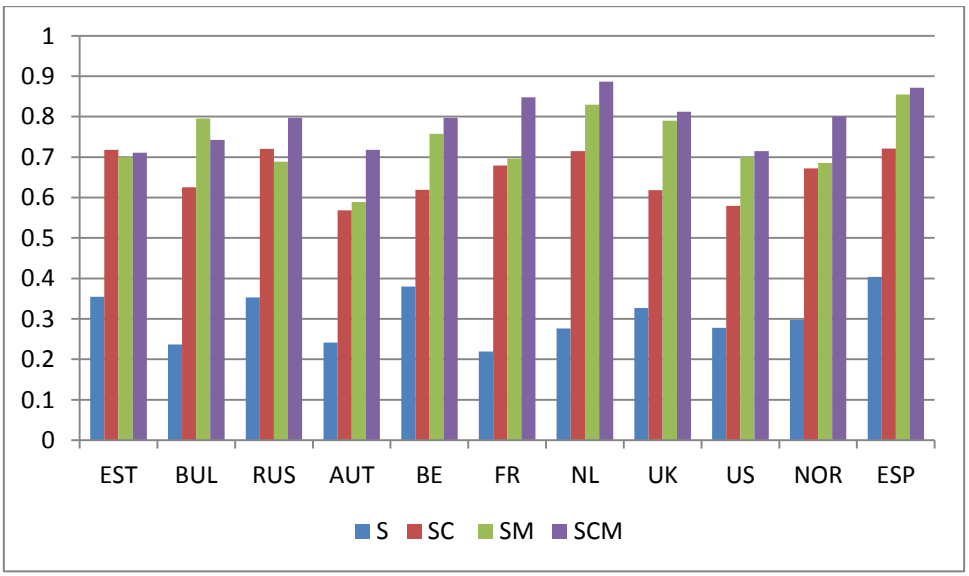

Figure 7. Probability of women to achieve a first birth by age 40 given partnership histories at age 35, by country.