Fertility in new couples, the influence of previous children.

Evidence from the UK

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I present an in-depth analysis of the role of parenthood on new union fertility of men and women in the UK. I focus on the childbearing process over multiple unions and try to clarify the relative importance of a first and a second shared child for couples having pre-union children as opposed to unions without pre-union children. I also intend to shed light on the fertility differential of men and women involved in intact families and step-families and provide new evidence on the influence of parentage and residential status of pre-union children on the risk of first and second birth of individuals in first or higher-order unions over the lifetime. Using Understanding Society, which provide full retrospective information on unions and births up to age 50, I run discrete-time event history models combined with a multilevel approach to estimate gender differences in fertility probability.

Introduction

During the last four decades marriage has declined in importance and different living arrangements have started to emerge across Europe. Family settings are currently heterogeneous across countries but similar shifts seem to occur. Relative to previous generations, fewer people live together as a couple, especially in marriage; more individuals live in unmarried couples; more children are born outside marriage; and fewer children live with both parents (Sobotka & Toulemon, 2008).

The ongoing transformation of the family is evidenced by the increasing number of individuals who are involved in sequential repartnering and multiple-partner childbearing (e.g., (Jansen, Wijckmans, Van Bavel, 2010; Beaujouan, 2012; Thomson, et al., 2014). Nevertheless, the literature has thus far paid little attention to understanding the influence of parenthood on partnering and childbearing, especially in the European context.

Great Britain is a unique context in which to conduct this analysis. In fact, it is one of the European countries where the increase in "conjugal succession" (Furstenberg & Spanier, 1984) and non-normative childbearing have been most pronounced: the number of births outside stable relationships has rapidly increased (Kiernan, 2006) and is among the highest in Europe (Sigle-Rushton, 2008) while the proportion of non-resident fathers set a historical high in the Continent (Andersson, 2002; Hoem & Toulemon, 2008).

In the United Kingdom new research into alternative family settings has attested the increasing diversity of men and women's biographies although, to my knowledge, no specific evidence on sequential repartnering and multiple-partner fertility has been provided. The number of men becoming fathers and then continuing living with children throughout the life course dropped

from 83% of those born in the first three decades of the 20th century to 63% of those born in the period 1960-1979 (Henz, 2014). Also, the occurrence of extra-marital births shifted from 15% in late 1970s (Sigle-Rushton, 2008) to about 33% of all births in the early 1990s (Ermisch & Francesconi, 2000). Between 1970 and 1990 the percentage of lone-parent families more than doubled from 7.5 percent to 18 percent (Ermisch & Francesconi, 2000). These trends have clearly triggered the raise in split families and, consequently, the increase in the prevalence of custodial parents (mainly women) and single-absent parents (mainly men). As more people experience union dissolution, the proportion of stepfamilies, in which at least one partner brings children into the new families, has increased reaching about 20% of the British families in the mid-2000s (Robson, 2010). Recent figures show the preponderance of custodial mothers over custodial fathers: 86% of stepfamily households in the UK have children from a woman's previous marriage/cohabitation (stepfather households), and 11% have children on father's side (stepmother households), while 3% feature children from both partners' previous marriage/cohabitation (Fido, et al. 2006; Smith, 2008).

Prior research and literature gaps

Childbearing in sequential relationships and in stepfamilies is a relatively unexplored topic in demographic research, particularly in (e.g., Goldscheider & Kaufman, 1996; Jefferies, Berrington, & Diamond, 2000; Thomson et al., 2014). Recent research in the United States and in Europe has documented an increasing proportion of parenting across multiple households ("serial parenthood"), in more recent cohorts (e.g., Guzzo & Furstenberg, 2007; Kreyenfeld & Heintz-martin, 2015; Thomson et al., 2014).

The knowledge on post-separation fertility mainly comes from two strands of research: step-parenthood and from multiple-partner fertility.

Conceptually, multi-partner fertility is distinct from step-parenthood. The former relates to the individual childbearing regardless of the partnership status, whereas the latter is determined by the partner's parental status (Carlson, 2006). On the one hand, an individual can have children from multiple partners even without being in a relationship with each of them. On the other hand, a step-family is created by the union - cohabitation or marriage (Guzzo, 2014) of two partners between whom one at least has had a child with another person, in a previous relationship. Not all stepfamilies share a common child, which is instead typical of any family with at least one multi-partner parent.

The literature on multiple-partner fertility concentrates on *individual*-level fertility, which is the number of children a person has had in his lifetime, and focuses particularly on the role of demographic characteristics, economic status, family trajectories and, to a lesser extent, individual attitudes. The research has been mainly justified by the high prevalence of this behavior among individuals from low educated, low SES, ethnic minorities, and in non-marital

relationships, especially in the US (Carlson, 2006; Guzzo & Furstenberg, 2007; Manlove, et al., 2008).

The literature on step-parenthood concentrates instead on fertility at a *couple*-level[1]. The goal of this research is to investigate how children born from previous relationships influence fertility in second or higher-order unions. Several studies show that stepfamilies have a higher fertility than intact families with the same number of biological children (Buber & Furnkranz-Prskawetz, 2000; Vikat, Thomson, & Hoem, 1999) as couples are more motivated to have a shared biological child to strengthen their new relationship (Griffith, Koo, & Suchindran, 1985)

The studies on step-parenthood (Henz & Thomson, 2005; Holland & Thomson, 2011; Thomson et al., 2002; Toulemon & Knudsen, 2006), with the exception of Vikat et al. (1999) and Li (2006) focus on fertility only at a couple level. The literature on multiple-partner fertility completely overlooks the influence of the family settings (the presence of partner's pre-union children and shared children) on the childbearing risk of the new couples and considers fertility only at the individual (or lifetime) level. With this research, I try to fill this gap by focusing on the transition to first and second birth at couple level, over the course of an individual's life, and not only in the new relationship after one union dissolution. The proportion of individuals having children from multiple partners in Western countries has increased from the 1980s (Thomson et al., 2014), which makes it appropriate to study the childbearing in a life-course perspective. Also, by looking at the role of the number of prior unions, this study also addresses the role of relationship career as a determinant of childbearing. It is possible to establish whether the impact of prior unions reduces people's chances of having children in new unions, under the assumption that people who go through a higher number of break-ups are less inclined to have children.

Second, studies on fertility in new partnerships do not take into account residence status of children from a previous relationship (Buber and Fürnkranz-Prskawetz, 2000; Stewart, 2002; Vikat & Furnkrantz, 2004), with the exception of Vikat et al., (2004),lack information on partner's children (Holland & Thomson, 2011; Vikat, Thomson, & Prskawetz, 2004), and neglect the influence of the youngest child and partnership duration in a new step-family (Henz & Thomson, 2005; Thomson et al., 2002). Further, mixed results have been found of women vs. men's pre-union parity (Beaujouan & Wiles-Portier, 2011; Stewart, Manning, & Smock, 2003; Vikat et al., 2004) and coresidential vs. non-resident stepchildren (Buber & Prskawetz, 2000; Olah, 2001), which thus requires additional analyses. This study improves upon previous research by specifically addressing the role of biological (co-resident and absent) and step-children on an individual's fertility in a newly formed couple.

[1] Individual and couple-level fertility are identical for individuals having children in intact families while the latter is greater for individuals who have children in distinct partnerships.

Third, in many of the studies above the design of the surveys privileges non- representative samples such as cohabiting and separated couples in urban areas and in the United States (e.g. Guzzo & Furstenberg, 2007; Carlson & Furstenberg, 2006) in spite of some exceptions using population representative data (Manlove et al., 2008). In particular, evidence from Europe is relatively small and, to my knowledge, it focuses only on Norway (Lappegård et al., 2011; Lappegård & Ronsen, 2013), France (Beaujouan, 2012) and Germany (Kreyenfeld & Heintz-Martin, 2015).

Fourth, this study innovates the existing literature also methodologically. Multilevel random-effect logit models are used to explicitly account for unobserved heterogeneity and, thus, correct for episode dependency[2]. This methodology also brings the advantages of tackling possible self-selection on unmeasured characteristics associated with multiple union entries and births, thus yielding unbiased estimates.

Data

The survey Understanding Society is used for this analysis. This study follows roughly 43,000 individuals born from the 1910s to 2000s and is representative of the UK population. It collects contemporary and retrospective events about work, partnership and fertility history. This analysis concentrates on life-course events of individuals born from 1950 to 1985, until their first interview in 2009-2010, or until age 55, in case of the oldest individuals.

Fertility histories derive from individuals' questionnaires in separate modules by dates. For each child, the respondent was required to recall the date of birth, the (possible) date of departure from her household and the reason (death, end of co-residence). The accuracy of this information allowes me to derive the full history of parent-child coresidence. Nevertheless, the data do not display full disclosure on partners' parenthood status: the records keep track only of the children that partners brought to the union, so that information on non-resident children is available only for the respondents.

Partnership histories are collected retrospectively at the first interview, carried out between 2009 and 2010. The entry into new partnership occurs in the month and year the person started living together with a new partner after the separation. A partnership (cohabitation or marriage) is defined as such if individuals live together for a month or longer, so that non-coresidential partnerships are not reported in the records.

The analytical sample consists of individuals who report at least one union (whether marital or cohabiting), regardless of their parental status. Therefore, individuals who do not declare any cohabiting partnership are ruled out of the analysis.

[2] The durations of episodes could be correlated to one another, thus violating the assumptions that all distributions are independently distributed. Indeed, the spells preceding a first (or second) birth in a couple are *not* independent because they are associated through individuals' (mostly) unobservable traits, such as preferences for mating, having children or being more/less fertile.

The dataset consists of the subsequent periods in which individuals, who experienced at least one separation or divorce, are single ("singlehood"). The effective sample consists of men and women who were successfully interviewed in the first interview of Understanding Society, and reported at least one partnership dissolution. The number of individuals at risk of new unions consists of 16,133 women (Table 1) and 11,614 men (Table 2), in the Appendix.

Research goals and theoretical mechanisms

The research question focuses on the childbearing process over multiple unions and clarifies the relative importance of a first and a second shared child for couples having pre-union children as opposed to unions without pre-union children. I also intend to shed light on the fertility differential of men and women involved in intact families and step-families and provide new evidence on the influence of parentage and residential status of pre-union children on the risk of first and second birth of individuals in first or higher-order unions over the lifetime.

As outlined in Bulatao (1981) and Griffith et al. (1985), the values parents attach to their children result from the combination of the utility that they expect to attain through their offspring and the costs they expect to incur. The parity of children designs parents' expected utility and the material and non-material costs of an additional birth. The first shared child in the couple may confer the parent status to an individual who has never experienced childbirth in his life (*parenthood effect*). Moreover, the birth of the first shared child reflects the couple's commitment to one another (*commitment effect*), regardless of the existence of previous children from either partner. Furthermore, a first shared child may act as a half-sibling to biological children already born from the couple, while a second shared child may represent a biological sibling to the shared first-born (*sibling effect*).

Summing up, this article tests for the following values that a first and second shared child in higher-order union may confer: the union commitment effect, the parenthood effect and the sibling effect.

Hypotheses

First, I test the hypothesis that parenthood effect adds up to commitment effect for couples with no pre-union children and represents an "extra boost" for achieving a first shared birth, as opposed to couples with pre-union children. The competing claim holds that step-children can represent a substitute for biological children and deprive the first shared birth of the "parenthood effect" motive, thus reducing the couple's chances of first birth transition. The first hypothesis is tested under different conditions, by weighing up the influence of (a) the number, (b) the residence status and (c) the parentage of step-children. The number of existing (step)children might increase the weight of costs relative to benefits of a first shared childbirth. By the same token, the co-residence of a stepparent with non biological children might increase the

emotional parent-child attachment and reduce the value of the parenthood effect of a first shared birth. Finally, whether a man or a woman brings biological children in a step-family might not be neutral for a couple's decision of a shared birth: some studies suggest that step-fathers' lack of warmth towards women's biological children in step-families (Hofferth & Anderson, 2003) may discourage the fertility of a new couple.

Second, I assess whether a couple forming a stepfamily is as likely as a couple with no births from previous unions to have a second common child to provide the first-born with a sibling (sibling effect). If the risk transition to a second shared birth for step-family couples is as high as for couples without step-children, the hypothesis that parents wish to produce a full sibling for the first shared child is confirmed. If not, I may find evidence of the alternative hypothesis that pre-union children act as half-sibling and substitute for biological children if they live in the same household. In other words, the issue here is whether the desire for a particular number of children is independent of the partnership, thus leading the number of children to depend only on the number of previous children. If not, a couple forming a stepfamily may end up having more children than the single partners would have if they stayed in a single partnership.

This hypothesis is being tested under different conditions, such as the existence of step-children, the youngest step-child being younger than five[3] and living with the couple at issue. The aforementioned characteristics are supposed to proxy for the closeness of the step-child with her prospective half-sibling(s) and design her as a substitute for a biological child and, ultimately, reduce the risk to the couple's transition to the second shared birth.

Methods

My analysis aims to analyze the influence of pre-union children on a couple's shared fertility by comparing newly established couples who have experienced previous births to the childless ones. I estimate first-birth (model 1) and second-birth (model 2) risks for men and women, separately.

I model the durations of transition to first and second birth within a couple, through multilevel discrete-time event-history models. The childbearing process can be thought of as a sequence of recurrent events: a person is at risk of first birth in a couple multiple times, as she may enter multiple times in a cohabiting union, while she is at risk of a second birth in a partnership providing that she has had a child beforehand with the same partner.

Therefore, two distinct analyses are being carried out to estimate the risk of first and second birth within the same union, respectively:

[3] The 5-year threshold is set in a paper by Holland and Thomson (2011), which indicates a 2-3 year spacing between consecutive births as optimal and states that childbearing risks "fall[s] off quite steadily after the youngest child is 5 years old" (page 116). "The larger the age gap between a child and her or his prospective half-sibling, the lower the value of a new baby as a sibling for the older child" (p. 117).

$$(1)\ First\ birth_{ijt} = y_{ij}(t) + \beta_{ij}X_{ijt} + \gamma_i W_i + u_i$$

$$(2)\ Second\ birth_{ijt} = y_{ij}(t) + \beta_{ij}X_{ijt} + \gamma_i W_i + u_i$$

where each outcome is the hazard of the event occurring in a spell j, at the time t as a function of time-varying $\boldsymbol{X}_{ijt}$ and time-invariant covariates $\boldsymbol{W}_i$. Individual-specific unobservables are represented by the term $u_j \sim N(0, \sigma^2)$, which is assumed to remain fixed over the observation period. $y_{ij}(t)$ is a function of time and consists of linear splines capturing the duration of the single status after union dissolution.

For each episode of transition to birth, I construct a person-month file containing time-varying and invariant information about the individual. Each episode can be viewed as nested within the individual, which yields a two-level structure of the data. In model (1), the episode in which a person is at risk of first birth begins nine months before the formation of the first cohabiting union[4], assuming that the individual is already exposed to the risk of the conception of a shared child before she sets up a household with her partner. In model (2), the episode at risk begins six months[5] after the first birth in a couple. All spells of first (second) birth risk end with the first (second) childbirth, the partnership dissolution or the partner's death.

The key independent variables concern the individual's parental status.

- The existence of each partner's pre-union children. In model (1) this variable allows for testing to what extent the number of pre-union children *per se* influences a couple's childbearing with respect to couples who have not experienced pre-union childbirths. For the risk of second birth (model 2), this variable will probably shows up in conjunction with the presence of co-resident pre-union children (see below).
- The co-residence of each partner's pre-union children. In model (1), this variable better specifies the influence of parenthood and commitment effect in the couple's transition to the first birth. In the model (2), in which the parenthood and commitment effects do not play any role, this variable serves to assess the existence of a sibling effect, whereby the co-resident half sibling(s) of the shared first-born would be the substitute for the biological sibling.
- The number of each partner's co-residential pre-union children; this variable adjusts the parenthood and commitment effects by addressing a differential *cost* of pre-union births on the transition to childbirth.

The control variables are either time-varying or time invariant will be: the relationship type (marriage or cohabitation); the respondent's age; the age of the youngest shared or step-child,

[4] This assumption allows for including all births that occurred in the second union but were conceived before the couple moves in.

[5] A six-month – rather than a nine-month spell – allows for pre-term births.

which is a proxy for the duration dependence along with the length of the union and the age of prospective parents; the type of the current relationship (direct marriage, cohabitation, marriage with a premarital cohabitation); the experience of divorce; *number of prior unions*; *duration of prior unions* ; indicators of individual's education and socio-economic status; parents' separation before individual turned 16; both parents working when the individual was 15; the cohort of birth.

Appendix

Table 1. Analysis sample of Understanding Society. Summary statistics per episodes of unions. Variables, *N*. Women.

	First union	Second union	Third union	Fourth union
Persons	*16,133*	*4,317*	*873*	*152*
Pre-union children				
0	*13,539*	*1,907*	*336*	*69*
1	*2,040*	*863*	*157*	*22*
2+	*554*	*1,547*	*380*	*61*
Pre-union coresident children				
0	*13,617*	*2,098*	*419*	*84*
1	*1,999*	*990*	*181*	*28*
2+	*517*	*1,229*	*273*	*40*
Step-children in the household				
1	*282*	*126*	*47*	*11*
2+	*187*	*207*	*48*	*10*
Number of births during the union				
0	*5,549*	*2,506*	*615*	*38*
1	*3,379*	*964*	*150*	*21*
2+	*7,205*	*847*	*108*	*17*
Age at union start				
18-22	*9,523*	*375*	*6*	*0*
22-26	*4,102*	*995*	*99*	*5*
26-30	*1,541*	*1,023*	*168*	*24*
30-35	*626*	*865*	*227*	*53*
35-42	*263*	*696*	*227*	*40*
42-50	*78*	*363*	*146*	*30*
Duration in months since union start				
0-12	*1,059*	*399*	*113*	*15*
13-24	*1,106*	*460*	*101*	*16*
25-36	*1,002*	*356*	*91*	*16*
37-60	*1,733*	*570*	*149*	*31*
61-120	*3,218*	*1,030*	*243*	*48*
121 -300	*5,392*	*1,294*	*168*	*25*

300 and later	*2,623*	*208*	*8*	*1*
Marital status at union start				
Marriage	*7,050*	*478*	*48*	*6*
Cohabitation	*4,329*	*1,963*	*491*	*95*
Pre-marital cohabitation	*4,754*	*1,876*	*334*	*51*

Table 2. Analysis sample of Understanding Society. Summary statistics per episodes of unions. Variables, *N*. Men.

	First union	Second union	Third union	Fourth union
Persons	*11,614*	*3,238*	*844*	*206*
Pre-union children				
0	*10,458*	*1,742*	*378*	*90*
1	*942*	*585*	*166*	*43*
2+	*214*	*911*	*300*	*300*
Pre-union coresident children				
0	*10,715*	*2,453*	*649*	*168*
1	*770*	*473*	*121*	*30*
2+	*129*	*312*	*74*	*8*
Step-children in the household				
1	*510*	*206*	*49*	*18*
2+	*521*	*215*	*52*	*22*
Number of births during the union				
0	*4,621*	*1,898*	*581*	*151*
1	*2,163*	*610*	*142*	*30*
2+	*4,839*	*730*	*121*	*25*
Age at union start				
18-22	*4,337*	*177*	*5*	*0*
22-26	*3,743*	*645*	*89*	*6*
26-30	*2,076*	*767*	*160*	*31*
30-35	*988*	*686*	*199*	*48*
35-42	*375*	*609*	*234*	*67*
42-50	*95*	*354*	*157*	*54*
Duration in months since union start				
0-12	*944*	*382*	*112*	*38*
13-24	*881*	*350*	*115*	*28*
25-36	*743*	*271*	*101*	*23*
37-60	*1,238*	*477*	*160*	*35*
61-120	*2,222*	*785*	*204*	*55*
121 -300	*3,824*	*841*	*148*	*27*
300 and later	*1,762*	*132*	*3*	*0*

Marital status at union start				
Marriage	*4,675*	*347*	*47*	*13*
Cohabitation	*3,463*	*1,581*	*548*	*135*
Pre-marital cohabitation	*3,476*	*1,310*	*249*	*58*

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