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Partners' Educational Pairings and Fertility Across Europe

Natalie Nitsche[1] · **Anna Matysiak**[1] · **Jan Van Bavel**[2] · **Daniele Vignoli**[3]

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Abstract We provide new evidence on the education-fertility relationship by using EU-SILC panel data on 24 European countries to investigate how couples' educational pairings predict their childbearing behavior. We focus on differences in first-, second-, and third-birth rates among couples with varying combinations of partners' education. Our results show important differences in how education relates to parity progressions depending on the education of the partner. First, highly educated homogamous couples show a distinct childbearing behavior in most country clusters. They tend to postpone the first birth most and display the highest second- and third-birth rates. Second, contrary to what may be expected based on the "new home economics" approach, hypergamous couples with a highly educated male and a lower-educated female partner display among the lowest second-birth transitions. Our findings underscore the relevance of interacting both partners' education for a better understanding of the education-fertility relationship.

Keywords Fertility · Education · Couples · Family · Europe

Introduction

Educational expansion and changes in childbearing behavior have been among the most striking features of the changing demographic landscape since the 1960s (Schofer and Meyer 2005). Women's participation in higher education has surpassed men's in

✉ Natalie Nitsche
natalie.nitsche@oeaw.ac.at

[1] Wittgenstein Centre (IIASA, VID/ÖAW, WU), Vienna Institute of Demography/Austrian Academy of Sciences, Vienna, Austria

[2] Centre for Sociological Research, University of Leuven (KU Leuven), Leuven, Belgium

[3] Department of Statistics, Computer Science, Applications, University of Florence, Florence, Italy

most developed nations (Esteve et al. 2016), highly educated women in particular have increasingly postponed the transition to motherhood, and the traditionally high childlessness among college-educated women has persisted and contributed to overall increases in childlessness via educational expansion (Gustafsson 2001; Miettinen et al. 2015). The relationship between educational and childbearing trajectories has been well studied, specifically regarding the linkages between tertiary education and women's childbearing behavior. We know that women postpone the transition to parenthood until educational enrollment has ended (Ní Bhrolcháin and Beaujouan 2012), that highly educated women postpone motherhood but have faster subsequent transitions to second births (Gerster et al. 2007; Klesment et al. 2014; Kreyenfeld 2002), and that childlessness tends to be highest among highly educated women (Nisén et al. 2014; Wood et al. 2014). Overall, it is accepted knowledge that education plays a crucial role in structuring individuals' life courses, even though the directionality or existence of causal effects often still remains elusive (Nisén et al. 2013; Stange 2011).

Less is known about how education relates to childbearing among men, but recent results suggest that education structures their life courses somewhat differently than women's (Trimarchi and Van Bavel 2017). For instance, among men, childlessness appears to be highest among the low-educated in Norway and Finland (Kravdal and Rindfuss 2008; Nisén et al. 2013). Such differential findings for the fertility-education nexus among men and women and the fact that children are usually born to couples underscore the relevance for giving center stage to couples in fertility research. In particular, studying whether educational pairings of men and women provide additional information in understanding childbearing behavior appears necessary given their differential education-fertility trajectories. Yet, a research gap regarding the question of how the education of both partners interacts with respect to childbearing behavior persists, despite a few earlier studies showing that interactive processes among partners are relevant for couples' fertility behavior (Corijn et al. 1996; Testa et al. 2014; Thomson and Hoem 1998) and despite the fact that children are born within coresidential unions much more often than not (Lichter et al. 2014; Perelli-Harris et al. 2012). Our study addresses this gap by examining whether and how both partners' educations matter and interact in predicting first, second, and third parity progressions across Europe.

Extending the existing knowledge on how the education-fertility relationship may systematically vary under consideration of the education of the partner is important and relevant from both a theoretical and an empirical perspective. Theoretically speaking, traditional hypergamous unions with a highly educated man and a lower-educated woman have long been predicted by Becker's economic family model to be the ideal environment for the production of children because of the partners' role specialization and lower opportunity costs of childbearing for her (Becker 1993). Conversely, Oppenheimer (1988, 1994) recognized the increasing importance of women's economic contribution to family economics and argued that the pooling of resources by partners is a vital strategy for ensuring the family's economic well-being. This resource pooling model implies higher fertility of highly educated homogamous couples compared with couples with only one highly educated partner. Both approaches predict how partners' relative education may relate to their childbearing behavior. No comprehensive study, however, has empirically tested whether unions of varying partners' educational pairings indeed display differences in fertility behaviors.

Yet, such an empirical test is particularly timely and relevant given the major shifts in men's and women's relative levels of educational attainment not only in the population in general but also on the couple level in particular. Studies have shown that the reversal of the gender gap in education (DiPrete and Buchmann 2013) has undermined the traditional pattern of educational *hypergamy* (women marrying up) and that *hypogamy* (women marrying down) has become more prevalent (De Hauw et al. 2017; Esteve et al. 2012). Relatedly, recent studies are directly pointing to a growing diversity among highly educated women in terms of their partners' education (Hou and Miles 2008; Mäenpää and Jalovaara 2015). For instance, highly educated women in Finland are currently more likely to be partnered with lower-educated men than previously (Mäenpää and Jalovaara 2015). Similarly, in the United States and Canada, the proportion of women with 16 or more years of education married to a partner with the same educational attainment has steadily decreased; thus, highly educated women today are partnering with a more diverse pool of men with respect to educational background than previously (Hou and Myles 2008). To date, we still know little about how such changing combinations of her and his education are associated with fertility.

These changing patterns of educational assortative mating likely affect fertility (Schwartz and Han 2014; Van Bavel 2012). One major reason for this expectation is that a shift from hypergamy toward hypogamy may affect who engages as the main breadwinner. Indeed, a recent study by Klesment and Van Bavel (2017) showed that an increase in the share of couples in which a woman is better educated than a man is associated with a higher proportion of families with a woman as the main earner. This, in turn, may affect the decision-making processes related to his and her labor market participation and to fertility (Oppenheimer 1994, 1997).

This study provides insights into how combinations of educational attainment levels of both partners relate to couples' childbearing behaviors across Europe, using the couple as the unit of analysis and following a conditional-sequential approach to fertility decision-making (Bulatao 1981; Namboodiri 1983). To this end, we use longitudinal panel data on 24 European countries, drawn from the European Union Statistics on Income and Living Conditions (EU-SILC). Selecting married and cohabiting couples who had no children, just one child, or two children at the time of first interview, we estimate how educational pairings are associated with subsequent rates of parity progression. We focus on those who completed at least secondary education (*medium education*) because this is the level of compulsory education in most European countries. Those who are unable to graduate from this level may face considerable challenges in raising families and managing their working lives that are qualitatively different from those who obtain at least a high school degree (Vandecasteele 2011). Although our models and tables show estimates for all educational pairings (including the low-educated), we limit the scope of this article to couples with partners who have achieved medium or high levels of education.[1]

Our analyses consist of three steps. In the first two steps, we pool all countries for a general overview. In the first step, we test whether both his and her individual

[1] *Medium education* includes ISCED Levels 3 and 4, which corresponds to a U.S. high school diploma and associate degrees (including individuals classified in the United States as having some college education). ISCED Categories 3 and 4 also include the vocational degrees of the occupational apprenticeship system that is widespread in some European countries. *High education* comprises ISCED Levels 5 and 6, corresponding to completed bachelor's degrees or postgraduate education.

educations significantly predict birth transitions. In the second step, we estimate the linkage between the educational pairings and parity progressions. In the third step, we distinguish groups of countries and fit our models separately by country group because family formation patterns show considerable variation across European regions. Leaning on commonly used classifications (Thévenon 2011), we group countries in four clusters: Nordic, Western European, Southern European, and Eastern European countries.

Our study provides new empirical evidence on how partners' education interacts in parity-specific ways in predicting couples' fertility behavior. The educational attainment of each partner matters for all examined parities—namely, first-, second-, and third- birth rates—next to the effect of the educational attainment of the other partner. With respect to first births, his education is significant only in interaction with her age, hinting at timing differences between the pairings. With respect to second and third births, highly educated homogamous couples display the highest and hypergamous couples show among the lowest rates in most countries, contrary to expectations based on conventional economic fertility theory. In sum, we demonstrate that taking only one partner's education into account is not sufficient for understanding childbearing behaviors, particularly in the contemporary environment characterized by changing gender relations and shifting patterns of educational assortative mating.

Educational Pairings and Fertility

Theoretical Considerations and Hypotheses

We view education as a nonreversible stock resource, which often is acquired before the partners come together or at least before children are born (Ní Bhrolcháin and Beaujouan 2012; Sassler and Goldscheider 2004). Along with other resources, such as the future income potential inherent to earning a college degree, education will subsequently affect the divisions of paid labor and unpaid domestic work in the couple. Another important resource is income. Income, however, can easily fluctuate—for example, in consequence of preference-related decisions made by the partners. Income is hence much more endogenous to the childbearing process than education and therefore is not included in our reasoning and analyses.

Theoretically speaking, we employ a conditional-sequential and couple-level perspective on fertility decision-making. According to the conditional-sequential perspective, each parity progression is influenced by different motivational, cultural, and family conditions; each birth changes the family conditions under which decisions are made and thus affects subsequent parity progression (Bulatao 1981; Namboodiri 1983). A couple-focused perspective is relevant for understanding childbearing behavior for reasons of both family economics and cultural gender roles. Leaning on five major theoretical perspectives, we formulate a set of hypotheses on how educational pairings relate to parity progression on the couple level.

First, from a microeconomic perspective, Becker (1993) argued that the gains to marriage are maximized when one partner specializes in breadwinning and the other specializes in caregiving and household management. Although this theory could, in principle, be gender-neutral, Becker aligned it with the gender role expectations and

unbalanced sex ratios prevailing in education from the mid- to late twentieth century. His approach implies thus that hypergamous couples will have the highest rates of entry into parenthood and the highest subsequent parity progression rates, given that women in these couples will experience lower opportunity costs of parenting.

> *Hypothesis 1* (H1): Hypergamous couples will display the highest rates of entry into parenthood and parity progressions to second and third births compared with all other types of educational pairings.

Next, Becker argued that for parents, "the effective price of children rises with income" because of interactions between the quality and quantity of children (Becker 1993:144; Becker and Lewis 1974). Accordingly, adding another child to the family will be increasingly costly for parents the more socioeconomic resources they have. This, he argued, is both due to the anticipated larger investments in children by parents with more resources and due to higher opportunity costs for the time that a mother with high human capital will spend away from the labor market while raising an additional child (Becker 1993; Becker and Lewis 1974). Applied to the issue of educational pairings and fertility, this would imply that couples with higher pooled education will be more reluctant to continue childbearing at higher parities.

In addition, quality-quantity considerations could lead to effects on the timing of the first birth. Parents who wish to invest more in the quality of their child may postpone the first birth the most in order to have time to accumulate resources before the birth. We, however, do not expect quantity-quality considerations to substantially affect the decision whether to have a first child because most coresidential couples will actually have a first child (or separate) (Jalovaara and Miettinen 2013). Quality-quantity considerations and their effect on first-birth timing will depend on both the resources available to the couple and their preferences and perceptions. We therefore refrain from formulating a hypothesis on how quality-quantity consideration will affect the first-birth timing by educational pairing.

> *Hypothesis 2* (H2): At higher parities, homogamous, highly educated couples have lower parity progression rates than other types of educational pairings.

The theory is not explicit, however, about what happens in case of hypogamy (the wife has more education than the husband), a situation that has become more prevalent in recent years (De Hauw et al. 2017; Esteve et al. 2012; Grow and Van Bavel 2015) and that is associated with higher relative earnings for women compared with their husbands (Klesment and Van Bavel 2017). A gender-neutral version of Becker's microeconomic approach would imply a reduced labor market involvement by the man to take care of children while the woman focuses on gainful employment if she has higher earning potential. This could imply equal fertility levels for hypogamous compared with hypergamous couples, yet Becker did not explicitly consider this possibility. Instead, he argued that women "have a comparative advantage over men in the household sector" (Becker 1993:38). Because women do most of the childcare work, they bear most of the opportunity costs of childbearing in terms of income losses. Given that such opportunity costs will weigh particularly high for couples in which the woman has the higher earning potential, hypogamous couples may have the lowest fertility.

Hypothesis 3 (H3): Hypogamous couples are expected to have the lowest parity progression rates across all parities.

Oppenheimer (1988, 1994, 1997) proposed a second theoretical approach to marriage and family formation, questioning Becker's specialization and trading model. Considering women's enhanced economic independence, Oppenheimer argued that couples with two earners will more easily be able to adapt to challenges in the labor market by pooling their resources (Oppenheimer 1997). This, in turn, would mean that couples with two highly educated spouses—and thus greater resources and future economic stability—may be in a more suitable situation to have a(nother) baby. Also, both economic and emotional opportunity costs of adding another child may be higher in couples with unequal resources. If educational hypogamy implies dependency on her income, then a loss of her full salary after a birth will burden the family more strongly compared with situations where both partners contribute or have high potential to contribute to the family income. Culturally speaking, changing gender roles today imply increased involvement (and desires and expectations thereof) of men in the family (Hook 2006). Men in hypergamous couples may more easily feel overburdened if they are the main breadwinners while aspiring to spend more time with domestic and care work after the birth of another child. All else being equal, these arguments could imply higher fertility among highly educated homogamous couples.

Hypothesis 4 (H4): Highly educated homogamous couples have the highest parity progression rates of all types of educational pairings.

Third, a similar but more nuanced prediction arises when we also consider the role of values and ideology among partners for their childbearing behavior. High education has been associated with more egalitarian gender ideology (Kane 1995; Panayotova and Brayfield 1997). Differences in gender ideology between individuals of different educational background may imply varying degrees of value consensus between partners, which in turn may affect couples' childbearing decision-making. Highly educated men may have more gender-egalitarian attitudes and may therefore be more supportive of her pursuing career and motherhood simultaneously when partners are equals in education. Career-oriented, highly educated women may therefore receive greater support in combining career and family from highly educated partners than from partners with less education. Ideally, value mismatches of partners will be prevented by the mating market. Yet, individuals have a large array of values, and a complete value consensus in all domains between partners appears unlikely. A recent study showed that partners are mismatched on gender ideology in approximately 20 % to 30 % of couples with children (Nitsche and Grunow forthcoming). We do not know of a study measuring ideology consensus or mismatch by educational pairing, so our argument about differential value mismatch by ideological pairing must remain hypothetical.

Hypothesis 5 (H5): Homogamous, highly educated couples have higher rates of parity progression to first and second births than hypogamous couples with a highly educated woman and a lower-educated man.

Additional predictions arise under consideration of the "bargaining" and "doing gender" approaches. The new home economics (NHE) approach and the pooling perspective assume team decision-making, implying one joint utility function maximized in agreement within the couple unit. The bargaining and doing gender approaches add a layer of complexity by focusing on individuals, their culturally gendered preferences, and interactive processes between the partners.

The bargaining perspective argues that individuals who hold an equal or larger share of the resources in the partnership may have more leverage in negotiating desired outcomes (Blood and Wolf 1960). The majority of family work is still done by women (Bianchi et al. 2012; Dotti Sani 2014), and the division of domestic work becomes more traditional after the birth of a child (Nitsche and Grunow 2016). It has been argued that women with higher resources have more leverage in enlisting their partner's help or outsourcing domestic and care work. Empirical studies have shown mixed evidence: increases in her absolute or relative income or education have been associated with a larger male share of housework and childcare in some studies (Lewin-Epstein et al. 2006) but not others (Nitsche and Grunow 2016). Outsourcing generally is predicted by higher household income (de Ruijter et al. 2005; Schneider and Hastings 2017) and may thus be particularly relevant for the more highly educated sample we study. However, cleaning, a routine chore typically done by women (Bianchi et al. 2000, de Ruijter et al. 2005), is increasingly outsourced as a woman's income rises (Treas and de Ruijter 2008), and outsourcing explains a part of the negative association between women's earnings and their time spent with housework (Killewald 2011). Outsourcing does not appear to change the partners' gender divisions of the remaining housework tasks (Gonalons-Pons 2015), yet it lowers women's daily time spent with housework and may thus be helpful in combining career and children nonetheless. Thus, women with more or equal resources in hypogamous or homogamous unions may successfully bargain for more support with domestic work, alleviating their disproportional time spent with housework, particularly after the birth of a child. Such negotiations may in turn encourage women to realize the couple's desire for children, particularly a second or higher-parity child. This leads to the sixth hypothesis, that bargaining can predict homogamous, highly educated couples and hypogamous couples to have an accelerated transition to the next child.

> *Hypothesis 6* (H6): Hypogamous couples with a highly educated woman and a lower-educated man, along with highly educated homogamous couples, will display the highest rates of progression rates to all parities.

Additionally, the "doing gender" framework (West and Zimmerman 1987) suggests that individuals are guided in their behavior by the expectations of others, and gendered behavior is thus created and reinforced in a process of "social doing," as individuals act in ways they think others expect of them (West and Zimmerman 1987). The need for such gender display can be more pronounced when individuals are in gender-atypical situations, such as in a hypogamous couple. To compensate, these partners could behave in ways perceived as more gender-typical. For example, they could take on a more gender-traditional division of domestic work, leading to greater work-family incompatibility for her and thus a slower transition to the next child, in line with H3. However, compensating behavior could also come in the form of her larger engagement

in mothering and hence an accelerated transition to the next child, consistent with H6. Hence, the doing gender perspective seems not helpful here in formulating a clear hypothesis about fertility because it does not imply a particular direction.

Regional Differences

Family dynamics, social structures, and employment conditions differ across Europe. In light of disparaging fertility, gender and work-family reconciliation regimes, the role of partnership dynamics may therefore vary for childbearing decision-making across contexts. Accordingly, our hypotheses can be differentiated by the social context. In the following, we describe the factors we believe may be most relevant for each of the four clusters in framing the couple dynamics we examine: childcare coverage, economic support for families, and employment conditions.

The Nordic countries feature ample support for work-family reconciliation (Rostgaard 2014). Full-day schools and high-quality public childcare to most children older than age 1 are available (Andersson 2008; Lappegård 2010; Thévenon 2011). Parental leave schemes have high wage-replacement rates and designated father months. Yet, child allowances are modest, and taxation of parents versus the childless does not differ, meaning that economic support for families with children beyond childcare is moderate (Organisation for Economic Co-operation and Development (OECD) 2017). In an environment with excellent care and leave infrastructure and a high integration of parents in the labor market (Ellingsæter 2009), the individual risk for careers and economic well-being and the time burden inherent in raising children may be lower than in other contexts. We therefore expect resource pooling, value consensus, or bargaining to play a less pronounced role in the Nordic countries, at least for first and second births, and we expect the smallest differences in parity progression rates between educational pairings involving at least one highly educated partner here. Because of modest financial support for families, resource pooling (H4) may matter for third- and higher-parity births, though.

Western European countries and the United Kingdom are a more diverse set in terms of work-family policies (Thévenon 2011). The German-speaking countries have a more gender-traditional culture with a male-breadwinner norm. Accordingly, childcare coverage for children under age 3 is lower, and the school day is shorter (Hank et al. 2004). Parental leave schemes have traditionally supported extended stays out of the labor market for child-rearing combined with low wage replacement rates, although change toward greater gender role equality is occurring in Germany (Ostner 2010). The French-speaking countries feature public systems in greater support of reconciling work and care, offering parents a wide range of childcare options for children of all ages (Gornick et al. 1997). The difference in the net average tax rate between the childless and married employees with children is, on average, largest in this cluster to the advantage of families (OECD 2017). This contextual background implies that couple-level factors may play a more important role for childbearing decision-making across Western Europe. If highly educated homogamous partners may be able to pool resources and afford private solutions while receiving higher monetary child-related transfers, we specifically would expect to find evidence supporting H4 (pooling) and H5 (values). Another possibility, however, is that hypergamous couples may display the highest parity progression rates to first and second births, given widespread

acceptance of gender schemas supportive of stay-at-home moms and part-time working mothers. Hence, we may also expect to find evidence for H1–H3 (based on the NHE).

The Southern European countries have comparatively meager support for work-family reconciliation, traditional attitudes toward women's roles (Matysiak and Węziak-Białowolska 2016; OECD 2017), pronounced postponement of first births, and low total fertility rates (TFRs) (1.32 in 2013; Sobotka et al. 2015). Strong labor market rigidities are present, making it difficult for the youth to enter the labor market and maintain employment (Adserà 2005, 2011; Vignoli et al. 2016). In this context, no clear predictions arise, and three hypothetical scenarios may apply. First, hypergamous couples may display the highest progression rates to first and second births, given that these couples might engage in traditional gender roles and that opportunity costs of parity progression are low (supporting H1 and H2). Second, highly educated homogamous couples may display the highest parity progression rates because they may potentially be most successful in securing their positions in the labor market, and pooling resources may also help them to purchase childcare (supporting H3 and H4).

The Central and Eastern European (CEE) countries are characterized by low levels of childlessness (Miettinen et al. 2015), younger average ages at first birth (ages 25–27), and low transition rates to second births (Zeman et al. 2017), overall resulting in low fertility levels (TFR between 37 and 1.65 in 2013). The CEE countries are specific in that they display a negative educational gradient in progressions to second births (Wood et al. 2014). This country group displays a very specific gender schema. Stemming from the era of socialism, women were perceived as the main care providers and at the same time were expected to work for pay and contribute to the household budgets (Pascall and Manning 2000; Treas and Widmer 2000). This gender schema is reflected in public policies, which offer long parental leaves and relatively poor childcare provision for the youngest children (Robila 2012; Szelewa and Polakowski 2008). However, family policies also vary considerably across the countries. For instance, the provision of early childcare and support for gender equality is more common in Slovenia or Estonia (Frejka and Gietel-Basten 2016). The provision of public childcare for children aged 3 and older is already relatively widespread, helping women to return to work (Robila 2012). Households are poorer, on average, than in the rest of the European Union. At the same time, adults strive for achieving higher, more Western-like living standards, which provides strong incentives for both partners to work for pay (Matysiak 2011; Sobotka 2011). In this context, highly educated homogamous couples may display the highest birth progression rates, particularly to second and higher-parity births, because they have more resources than other couples (supporting H3 and H4).

Previous Research

Although empirical studies have incorporated both partners into investigations of childbearing behavior, only few studies have explicitly examined how the interaction between both partners' educational attainment is associated with fertility behavior. Previous research examining the relationship between relative education and childbearing behavior has provided only fragmented knowledge on the topic. First, in terms of the theoretical framing, some studies focused on economic resources, gender roles, and opportunity costs (Jalovaara and Miettinen 2013; Wirth 2007). Others framed the

research around the themes of resource pooling and work-family compatibility issues (Dribe and Stanfors 2010), or argued in terms of fertility-related preferences of the partners and power dynamics in the bargaining over fertility, which may be affected by relative education and value consensus between partners (Bauer and Jacob 2010; Corijn et al. 1996). Second, available studies have focused on different parities. Some investigated the transition to parenthood and the probability of remaining childless (Bauer and Jacob 2010; Corijn et al. 1996; Jalovaara and Miettinen 2013; Wirth 2007), and others analyzed the transition to second and third births (Dribe and Stanfors 2010). Third, they have used diverse measures of hypogamy and hypergamy. Some looked solely at her and his educational pairings, and others combined the information on education with information on occupational status (Osiewalska 2017) or income (Dribe and Stanfors 2010). Next, studies concentrate on different country contexts and periods. Finally, and probably partly because of the aforementioned reasons, they have presented conflicting findings. For instance, Corijn et al. (1996) and Jalovaara and Miettinen (2013) found no significant interaction effects between her and his educational attainment on the entry into parenthood for Flanders and Finland, respectively; conversely, Wirth (2007) and Bauer and Jakob (2010) did find such effects for Germany. Hypergamous couples appear least likely to remain childless in Germany (Bauer and Jacob 2010; Wirth 2007) but as likely as the homogamous couples in Austria and Bulgaria (Osiewalska 2017). Finally, highly educated homogamous couples had higher second- and third-birth rates in Sweden (Dribe and Stanfors 2010). In sum, research has provided only limited knowledge about the linkages between educational pairings and childbearing, and an overview study that conceptualizes partners' interactive education and links it to childbearing in a consistent and comparative way is still lacking. This article fills this important gap.

Data and Method

Data

The data for the analyses come from the EU-SILC, an ongoing household panel launched in 2003, with nearly all EU member states participating by 2005. It provides a household roster and collects detailed information on all household members aged 16 and older. It is a rotational panel by design, consisting of four subsamples interviewed in parallel for four consecutive years (except for an eight-year observation period for Norway and France), but each subsample enters the panel at another point in time (for details, see European Commission 2010). We use EU-SILC data because they provide full household rosters; offer detailed information on educational attainment and enrollment of all household members; have a longitudinal panel design; cover a wide array of European countries; and are current and ongoing, hence depicting the current family situation in Europe. However, the data also have disadvantages: a short observation duration and a lack of retrospective information on nonresident children and fertility, partnership, and education. In consequence, we reconstruct the number of children a couple has from the household roster, using information on relationship statuses among household members and their birth years. Thus, our definition of parity refers to the parity of the couple and equals the number of children living with the couple. We

cannot exclude that the couple or either partner may have had children earlier in life who are not living in the household anymore, implying the possibility of left-censoring. To minimize the risk of underestimating the true parity, we observe women up to age 40. Given that our focus is on the highly educated subset of the population who, on average, have the latest ages at parenthood (Rendall et al. 2005), setting a lower age limit is not very likely to prevent us from misclassification bias but may result in substantial loss of information on higher-order births to highly educated women. In alternative models using a variety of younger age cutoffs in order to test for a possible left-censoring bias (models not shown but available upon request), we found results very consistent with the findings obtained from the model with the age limit set at 40; thus, misclassification bias, if present, does not seem to alter our results meaningfully.

Analytic Samples

We construct three analytic event-history subsamples—namely, for the transition to first births, second births, and third or higher-order births—and limit our analysis to cohabiting and married couples in which women were aged 18–40 in all three samples. All couples are at risk for childbearing until that event occurred, until union disruption, or until the date of the exit from the panel, whichever came first. We allow both partners to reenter the sample in case of repartnering.

Couples who are childless at the start of the panel are at risk of conceiving the first child. It is important to note that the women in this subsample of couples are quite heterogeneous in terms of age (observed), union duration, and time since graduation (unobserved)—that is, with respect to the life course stages in which they are observed at risk for first childbirth. For instance, the majority of childless women observed at age 25 will eventually become a mother, but this cannot be said about childless women at ages 35 or older. As a result, age effects on the transition to parenthood will reflect not only age-related processes but also selection effects. Because our data do not allow us to take union duration or time since completing education into account, we cannot control for this selectivity in the analyses.

We limit the samples of couples at risk of second, third, or higher-order births to those whose youngest child is aged 5 or younger. Couples with older children are less likely to have another child because of their preferences, health conditions, or union quality. In fact, 80 % of second births and 70 % of third births observed in our pooled sample occurred within five years after the birth of the previous child. Moreover, including longer birth intervals would make it more likely that the current partner is a new partner and not the biological parent of the older sibling(s) (Kreyenfeld and Heintz-Martin 2015). We estimated additional models without this restriction, and the results did not differ (models not shown).

In mid-2016, the EU-SILC panel was available for 30 European countries, 24 of which are included in our sample. We exclude data from Germany because of quota sampling and data from Spain and Ireland because of nonresponse substitution for households that dropped out, which subsequently affected the sample representativeness (Iacovou et al. 2012). In addition, because we find unrealistically low numbers of births by exposure time in Cyprus, Malta, and Romania when compared with the period TFR, we also exclude these countries from the sample.

Table 1 Sample description: Couple years at risk and number of events, by parity

	First Births		Second Births		Third Births	
	Exposure	Events	Exposure	Events	Exposure	Events
Nordic	5,447	626	3,665	805	9,472	396
Western	8,173	1,010	5,859	1,286	13,238	605
Southern	3,813	677	4,778	595	6,792	172
Eastern	5,604	622	8,268	799	14,303	332
Total	23,037	2,935	22,570	3,485	43,805	1,505

We conduct analyses on (1) a sample that pooled all countries and (2) four subsamples of country groups. The Nordic country group includes Denmark, Finland, Norway, and Sweden; the Western group comprises Austria, Belgium, France, Luxembourg, the Netherlands, and the UK; the Southern group consists of Greece, Italy, and Portugal; and the Eastern European group includes Bulgaria, the Czech Republic, Estonia, Croatia, Hungary, Lithuania, Latvia, Poland, Slovenia, and Slovakia. Table 1 shows information on exposure-observations and numbers of events in each of the sample in the four clusters.

Models and Covariates

Dependent Process, Models, and Educational Pairings

Because our data are measured annually, we estimate random-effect logit models separately for the transitions to first, second, and third and higher-order births. We perform our analysis stepwise. First, we test how her education affects parity progressions. Second, we add his education to test the role of both partners' own education. Third, we interact his and her education to test whether the effect of her or his education varies with changes in the education of the partner. We measure his and her education in three main groups: low (ISECD-97 0–2: lower secondary or second stage of basic education at most), medium (ISCED-97 3–5: upper secondary and postsecondary nontertiary), and high (ISCED-97 5–6: first and second stage of tertiary) education. Fully interacting all categories implies that we have nine educational pairing combinations (hers high/his high, hers high/his medium, and so forth). Fourth, we estimate the interacted models again but now simplify the educational pairing groups. Because few couples feature a combination of a high- and a low-educated partner, we group couples with a high-educated man and a lower-educated woman (medium and low education) as hypergamous and couples with a high-educated woman and a lower-educated man (medium or low education) as hypogamous.[2] We still differentiate between

[2] This decision is supported by empirical tests from the interacted models in Table 4. There are no statistically significant differences between pairings with a highly educated woman and a medium-educated man versus a low-educated man, or a high-educated man and a medium-educated woman versus a low-educated woman on the second-birth rate (p > chi-squared = .09; p > chi-squared = .48) or the third-birth rate (p > chi-squared = .84; p > chi-squared = .13).

highly educated homogamous, medium-educated homogamous, and low-educated homogamous couples (graphs omit pairings with low/low and low/medium combinations). Hence, the four pairing categories of main interest for our analyses are (1) both are highly educated (both high); (2) both medium-educated (both medium); (3) she is highly educated, and he has lower education (hers high/his lower); and (4) he is highly educated, and she has lower education (his high/hers lower). In the two latter categorizations, *lower* refers to all partners with medium or low education. The distribution of educational pairings differs strongly across countries, as shown in Table 2. The grouping with both partners having medium education is, on average, the most prevalent and serves as the reference category in all models. Highly educated homogamous couples are most frequent in the North and West (at approximately 25 % to 30 % of couples). It is noteworthy that the distribution of hypogamous couples varies across parities and clusters. In Southern Europe, hypogamous couples are about as prevalent as highly educated homogamous couples, whereas they are a smaller group relative to highly educated homogamous couples in the other parts of Europe. The educational pairing variable is introduced in all models in the fourth step. The models for first births additionally feature an interaction between the educational pairings and her age to account for the fact that highly educated women start their childbearing careers later because of longer participation in education. The Bayesian information criterion (BIC) advised against including interactions between educational pairings and the time elapsed since the previous birth in the pooled and country-cluster models for second and third and higher-order births. For these births, we present coefficients for educational pairings that are not interacted with time.[3] We do not use weights for the analyses.

To interpret our findings, we rely on predicted probabilities instead of odds ratios. Odds ratios should not be interpreted across various countries or samples; instead, prior research has recommended comparing predicted probabilities (see, e.g., Mood 2010; Wooldridge 2010). We compute such probabilities and their standard errors by the woman's age for first births and by years elapsed since the birth of the previous child for second and higher-order births. We compute first-birth probabilities for women aged 23–40 because a few couples in the sample include a highly educated partner under the age of 23. The probabilities are estimated for all coresidential couples regardless of their marital status—given

[3] Similarly, the likelihood ratio test advised against the time interactions for third and higher-parity births (chi-squared = 14.48, $p = .2711$). Yet, it supported the time-interacted model for second-birth progressions in the pooled model (chi-squared = 33.43, $p = .001$). However, when we tested time-interacted models by country cluster, this support for the age-interacted model was present only for the Southern countries (chi-squared = 21.14, $p = .048$). This cluster actually features our weakest findings for second-birth progressions in the final model, which is not time-interacted. The interacted model for the South (model not shown but available upon request) indicates stronger birth rate differences between the educational pairings of interest in the first years after the first birth (with the highest rate among highly educated homogamous couples). With time passing, hypergamous and hypogamous couples seem to catch up on the second-birth rate with homogamous highly educated couples. Because the model that is not time-interacted is more appropriate for all third-birth progressions and second-birth progressions in the other clusters, we settled on specifications that are not age-interacted for all second- and third-birth models. They are more parsimonious and allow for clearer and consistent presentation of the results. Our findings and conclusions are not affected by this choice and remain unchanged if we add the time interaction to the second-birth progression model in the Southern cluster.

Table 2 Descriptive sample statistics, by country group

Country Group	% Enrolled	% Both High	% Both Medium	% Hers High, His Lower	% His High, Hers Lower	% Both Low	% Hers Medium, His Low	% Hers Low, His Medium	% Cohabiting	Mean Age	Mean Relative Age	Mean Age at First Birth	Mean Age of First Child
First Birth													
Nordic	21.24	25.13	32.47	18.38	9.58	3.03	6.37	5.04	71.61	28.39	2.67		
Western	5.62	31.46	26.03	19.31	10.29	3.91	5.35	3.66	56.79	29.64	3.24		
Southern	2.85	12.43	30.33	13.47	5.68	15.97	14.32	7.80	20.90	31.88	3.65		
Eastern	7.44	18.97	43.75	17.30	8.29	3.89	4.18	3.63	43.57	28.93	3.29		
Total	9.23	23.69	32.53	17.60	8.85	5.78	6.86	4.69	50.88	29.57	3.19		
Second Birth													
Nordic	8.70	30.00	26.15	23.49	8.48	2.82	4.94	4.12	53.03	30.46	2.54	28.67	2.40
Western	1.37	28.19	26.72	17.97	10.12	5.68	6.76	4.56	35.66	31.05	3.06	29.06	2.49
Southern	0.71	10.92	29.07	12.02	5.88	19.52	15.37	7.20	11.15	32.06	3.53	29.54	2.76
Eastern	2.24	17.30	45.17	18.09	6.11	4.14	5.40	3.78	22.41	28.82	2.94	26.60	2.84
Total	2.79	21.15	33.53	17.73	7.57	7.51	7.75	4.76	28.97	30.38	3.02	28.23	2.65
Third Birth													
Nordic	4.64	28.24	26.65	21.48	9.68	2.78	6.00	5.17	32.23	33.68	2.57	26.34	2.80
Western	0.57	26.03	26.76	14.05	10.64	8.94	6.85	6.73	19.81	33.80	2.86	26.70	2.79
Southern	0.24	9.74	25.40	9.66	5.64	26.21	14.65	8.70	5.82	34.32	3.93	26.52	2.89
Eastern	0.51	14.64	47.55	12.82	5.94	6.62	5.96	6.47	15.63	32.41	2.97	23.79	2.90
Total	1.39	20.33	33.24	14.60	8.14	9.5	7.57	6.61	19.01	33.41	3.00	25.65	2.84

that the proportion of married couples varies strongly across clusters and parity, as shown in Table 2—while the values of the other covariates are held constant at their mean or modal values. Next, in order to draw conclusions on how birth probabilities differ across education pairings, we compare the birth probabilities for all considered educational pairings with the birth probability computed for highly educated homogenous couples. We test differences between the probabilities using standard significance tests. In upcoming figures, we graph the predicted probabilities, with differences between highly educated homogamous couples and all remaining couple types marked as significant for p values smaller than .10.

Control Variables

We estimate the relationship between educational pairing and first-birth risks net of her and his enrollment in education, her age, the absolute difference between his and her age, marital status (married vs. cohabitation), and year dummy variables to control for period effects. In the EU-SILC, *enrollment* is defined as being currently enrolled in the formal education system, meaning primary, secondary, or tertiary schooling. Vocational training activities outside of the formal education system do not qualify as enrollment. Enrollment and education are not coded mutually exclusively. Each couple is assigned an educational pairing value in one variable, and two other variables indicate whether either of the partners is enrolled in education. We treat both educational enrollment and attainment as time-varying covariates and allow for entry in and exit from enrollment as well as educational upgrading of either partner. Enrollment and attainment level are lagged by one year because we are interested in the relative educational pairing at the time of conception instead of at the time of birth.

We model her age using a quadratic polynomial to allow for a curved shape of the age effect. We also estimated alternative models with a more flexible age specification using dummy variables for each year of age (or five-year groups), but the predicted probabilities by age were very similar to those from the more parsimonious specification with the continuous terms. In the models for second and higher parities, we additionally control for her age at first birth and the age of the youngest child.

Table 2 gives summary statistics for all explanatory and control variables and for each of our analytical samples.

Limitations

For proper interpretation of our results, we need to mention the limitations of our empirical approach at the outset. First, our data span only a small episode of couples' life courses, precluding us from distinguishing between timing and quantum effects. In other words, we cannot verify whether couples who did not have a (next) child within three years eventually had one later. Hence, the differences in the birth rates that we find might be entirely due to a closer spacing of births among certain types of couples and not translate into quantum

differences. Second, when we model the progression to second and higher-order births, the analytical sample necessarily consists of those couples who completed the transition to lower birth orders. The latter may be a selective subsample of the complete population of couples with given educational pairings. We cannot control for such a selection effect. For example, couples' parity progression will depend on the stability of their unions. Because the risk of separation may vary by educational pairing, our sample of unions of a given pairing type might be selected on stability. Birth rates might hence be higher among certain couples simply by virtue of higher union stability and the resulting longer exposure time to the risk of conception. Third, we cannot control for fertility preferences of the couples because our data do not contain this information, and the short observation window precludes the possibility to estimate models that control for unobserved characteristics. Finally, despite extensive checks, we cannot fully exclude the possibility of left-censoring. As a result, couples with children who are not present in the household will be classified as having one child fewer than they actually have. Our analyses show that highly educated homogamous couples have the latest first births, suggesting that other couples may be more at risk of such parity misclassification. If this bias is present, the difference in second and third-birth rates between highly educated homogamous couples and the other couples may be overestimated. It appears unlikely, though, that misclassification is so unequally distributed across groups or that it would be large enough to disturb our highly robust findings.

Results

Her, His, and Their Education: Testing Model Fit

Tables 3 and 4 present stepwise models, evaluating model fit for the models with her education only, her and his education additively, and her and his education interacted. High education is the reference category. The likelihood-ratio tests indicate that each subsequent model fits the data better than the previous one for first births (chi-squared = 24.45, p = .004 and chi-squared = 16.5, p = .0029) and third births (chi-squared = 27.27, p = .000 and chi-squared = 11.82, p = .019). The first-birth models feature age interactions, given that tests from our main models (fourth step) have shown that age-interacted models fit the data significantly better. Testing stepwise models without age interactions leads to the misleading conclusion that adding his education does not improve model fit for first births. Hence, for first births, educational pairings differ specifically with respect to her age and, hence, birth timing. Education thus relates to first-birth progressions in a complex way because it is contingent on the partner's education and age.

For second-birth progressions, the model with her and his education fits the data significantly better than the one with her education only (chi-squared = 27.47, p = .000), but the interacted model does not improve the model further (chi-squared = 5.15, p = .272). However, some of the educational pairings differ significantly from each other: namely, those involving one or two highly educated partners (see Table 4). This

Table 3 Logit model of progression to first birth, by her and his education

	First Births					
	Her Education Only		Her and His Education		Her × His Education	
	Estimate	SE	Estimate	SE	Estimate	SE
Her Education						
High	Ref.		Ref.			
Medium	–0.336**	0.071	–0.298**	0.078	–0.038	0.114
Low	–0.636**	0.124	–0.628**	0.135	–0.240	0.325
His Education						
High			Ref.			
Medium			–0.103	0.078	0.021	0.088
Low			0.002	0.119	0.143	0.179
Interactions of Her Age and Partners' Education						
Hers medium × Her age	–0.096**	0.014	–0.075**	0.015	–0.076**	0.015
Hers medium × Her age squared	0.006**	0.003	0.004**	0.003	0.004	0.003
Hers low × Her age	–0.136**	0.019	–0.102**	0.021	–0.104**	0.021
Hers low × Her age squared	0.012**	0.003	0.011**	0.004	0.012**	0.004
His medium × Her age			–0.051**	0.015	–0.058**	0.015
His medium × Her age squared			0.008**	0.003	0.010	0.003
His low × Her age			–0.076**	0.021	–0.080**	0.021
His low × Her age squared			0.001	0.004	0.001**	0.004
Education Interactions						
Both high					Ref.	
Hers high, his medium					(see his medium)	

Table 3 (continued)

	First Births					
	Her Education Only		Her and His Education		Her × His Education	
	Estimate	SE	Estimate	SE	Estimate	SE
Hers high, his low[b]					(see his low)	
Hers medium, his high					(see hers medium)	
Both medium					–0.373**	0.129
Hers medium, his low					–0.461*	0.217
Hers low, his high					(see hers low)	
Hers low, his medium					–0.726*	0.351
Both low					–0.358	0.374
Age						
Her age	0.020†	0.011	0.048**	0.014	0.054**	0.014
Her age squared	–0.019**	0.002	–0.023**	0.003	–0.024**	0.003
Tests						
AIC	17,202.43		17,189.97		17,181.92	
BIC	17,569.82		17,606.35		17,630.96	
Likelihood ratio test (against her education)			24.45	0.0004	40.51	0
Likelihood ratio test (against her and his education)					16.05	0.0029

Note: Models control for her enrollment, his enrollment, age difference of partners, country indicators, calendar year indicators, and marital status.

†$p \leq .10$; *$p \leq .05$; **$p \leq .01$

Table 4 Logit model of progression to second births and third and higher-parity births, by her and his education

	Second Births						Third and Higher-Parity Births					
	Her Education Only		Her and His Education		Her × His Education		Her Education Only		Her and His Education		Her × His Education	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Her Education												
High	Ref.		Ref.				Ref.		Ref.			
Medium	–0.433**	0.054	–0.347**	0.057	–0.410**	0.099	–0.253**	0.064	–0.161*	0.069	–0.288**	0.112
Low	–0.626**	0.086	–0.452**	0.092	–0.930**	0.307	0.010	0.085	0.053	0.094	–0.234	0.258
His Education												
High			Ref.						Ref.			
Medium			–0.190**	0.058	–0.259**	0.074			–0.320**	0.068	–0.442	0.097
Low			–0.435**	0.086	–0.376*	0.164			–0.063	0.091	–0.135**	0.196
Interactions												
Both high					Ref.						Ref.	
Hers high, his medium					(see his medium)						(see his medium)	
Hers high, his low					(see his low)						(see his low)	
Hers medium, his high					(see hers medium)						(see hers medium)	
Both medium					0.136	0.120					0.191	0.146
Hers medium, his low					–0.088	0.204					0.300	0.235
Hers low, his high					(see hers low)						(see hers low)	

Table 4 (continued)

	Second Births						Third and Higher-Parity Births					
	Her Education Only		Her and His Education		Her × His Education		Her Education Only		Her and His Education		Her × His Education	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Hers low, his medium					0.523	0.328					0.556*	0.284
Both low					0.445	0.355					0.210	0.330
Tests												
AIC	18,518.79		18,495.32		18,498.18		12,684.36		12,661.09		12,657.28	
BIC	18,861.62		18,854.47		18,889.98		13,050.45		13,044.62		13,075.67	
Likelihood ratio test (against her education)			27.47	0	32.62	0			27.27	0	39.08	0
Likelihood ratio test (against her + his education)					5.15	0.2724					11.82	0.0188

Note: Models control for her enrollment, his enrollment, age difference of partners, country indicators, calendar year indicators, marital status, age at first birth, age of youngest child, and age of youngest child squared.

$^{\dagger}p \leq .10$; $^{*}p \leq .05$; $^{**}p \leq .01$

again highlights the importance of evaluating how education affects parity progression contingent on the education of the partner also for second births, particularly for the highly educated. In sum, we present strong evidence for the relevance of both partners' education for all three birth progressions. Moreover, modeling interaction effects of both partners' education is needed to fully understand first and third and higher-parity progressions and enhances our understanding of progressions to second births among more highly educated couples.

Educational Pairings and Birth Progressions

Tables 5, 6, and 7, displayed in the appendix, show full model results with the final simplified educational pairing specifications. Couples with two medium-educated partners are the reference category; coefficient p values indicate differences between homogamous medium-educated couples and the other pairings. We also test the pairing-coefficients against each other, listing those test statistics and p values underneath the model tables (for couples including a highly educated partner).

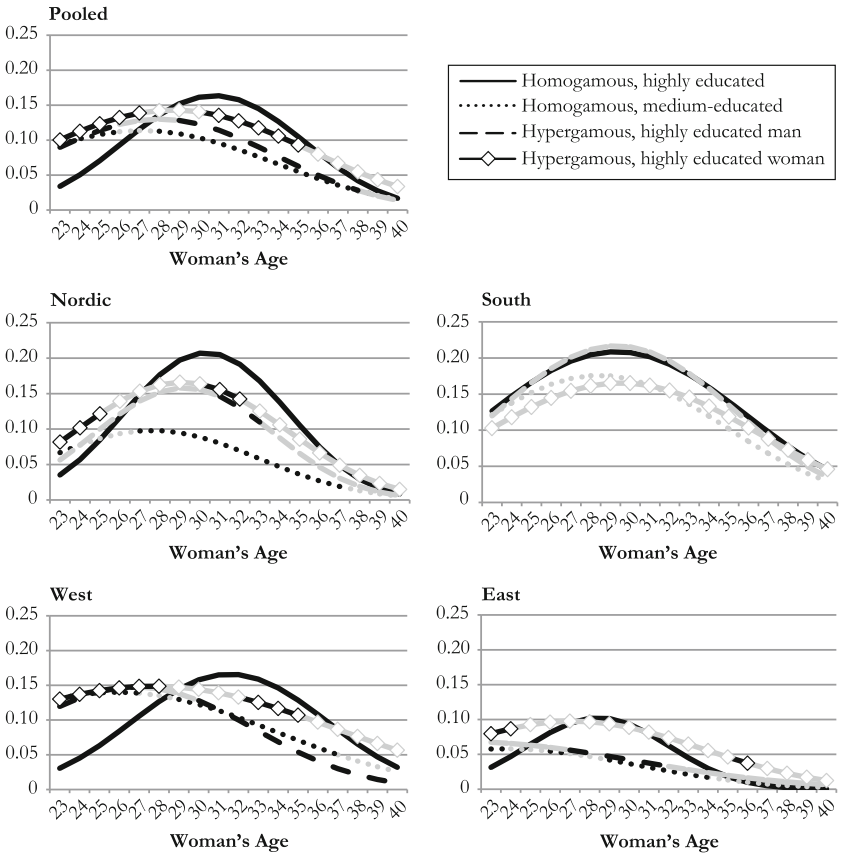

Fig. 1 Predicted first-birth rates. Homogamous, highly educated couple is the reference category and is always shown in black. Remaining lines are shown in black if the difference between birth rate of the represented pairing and highly educated homogamous couples is significant at $p < .10$; they are shown in gray if the difference is not significant

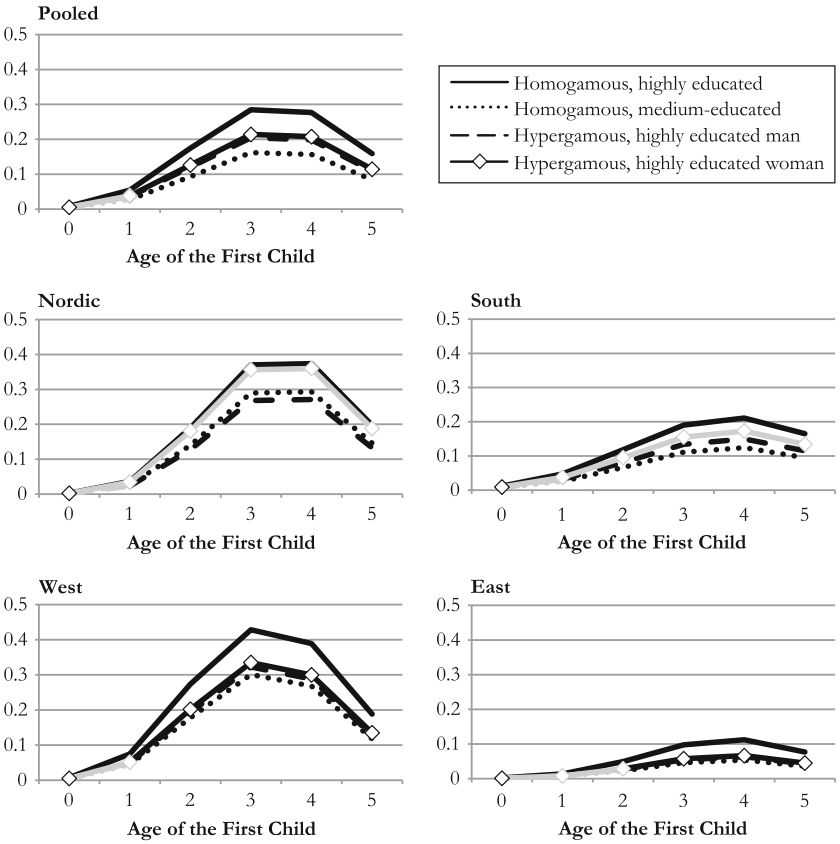

Fig. 2 Predicted second-birth rates. Homogamous, highly educated couple is the reference category and is always shown in black. Remaining lines are shown in black if the difference between birth rate of the represented pairing and highly educated homogamous couples is significant at $p < .10$; they are shown in gray if the difference is not significant

For reasons explained in the Method section, we rely on predicted probabilities, derived from the shown models, in interpreting our findings. These probabilities are presented in Figs. 1, 2, and 3. The figures show four lines each, representing the educational pairings of our main interest: (1) both are highly educated; (2) she is highly educated, and he has lower education; (3) he is highly educated, and she has lower education; and (4) both have medium education. Lines colored in black indicate significant differences in birth rates of the represented pairing compared with the pairing of highly educated homogamous couples (a paring that is always represented by a black solid line). Gray lines, or line portions, indicate nonsignificant differences in the prediction of this group compared with the predicted birth rate of highly educated homogamous couples.

First Births

Figure 1 plots predicted first-birth rates by woman's age. The first panel shows the results from the pooled model, and subsequent panels show the results by regions. The

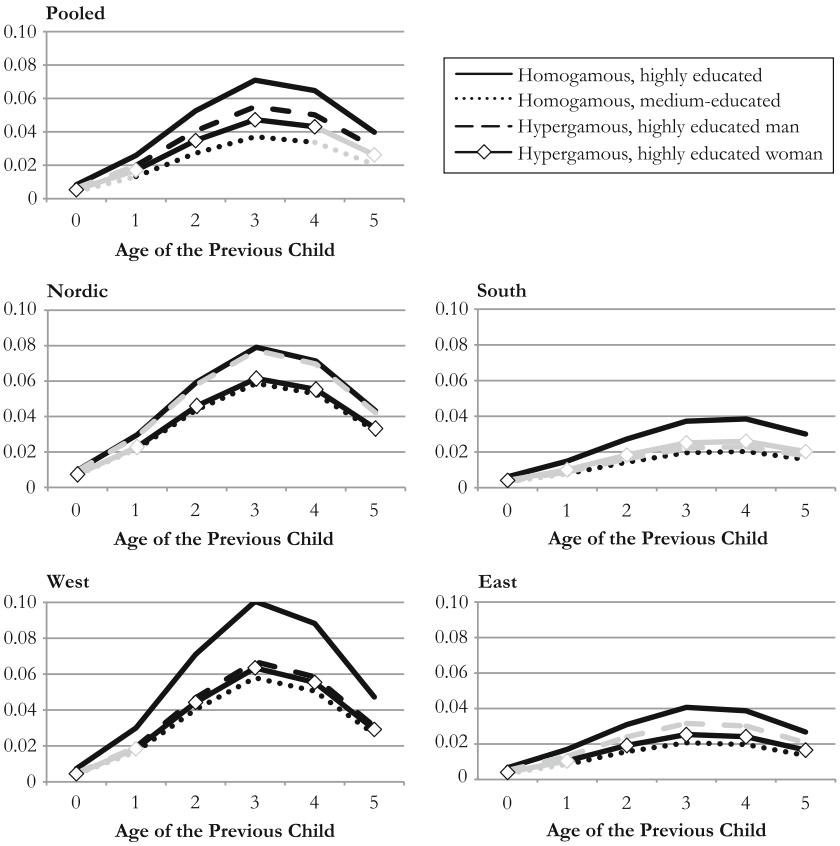

Fig. 3 Predicted third-birth rates. Homogamous, highly educated couple is the reference category and is always shown in black. Remaining lines are shown in black if the difference between birth rate of the represented pairing and highly educated homogamous couples is significant at $p < .10$; they are shown in gray if the difference is not significant

lines for different educational pairings cross, indicating that the association between these pairings and first-birth rates depends on age. Rates of transition to parenthood within her education differ significantly by his education, and vice versa. In the pooled model, couples with two highly educated partners have higher predicted hazards of becoming parents at later ages (30–37), whereas the hypergamous as well as hypogamous couples with only one highly educated partner are significantly more likely to experience a first birth between her ages of 23–26. This pattern holds for the Nordic and Western groupings. In the Nordic countries, difference between the pairings involving at least one highly educated partner are not as pronounced and are significant only between her ages 23–25 and 30–33. In Western Europe, highly educated homogamous couples have much lower first-birth rates than hypogamous or hypergamous couples until her age 26. After her age 30, birth rates of highly educated homogamous couples are significantly higher than the rate of hypergamous couples throughout and are higher than that of hypogamous couples between her ages 31–34. In Eastern Europe, the timing of first births is generally shifted to younger ages across all pairings.

Interestingly, hypogamous couples have the highest birth rates throughout all ages. They have significantly higher birth rates than highly educated homogamous couples at ages 23 and 35; otherwise, the differences between these two pairings are not significant. Southern Europe does not show any statistically significant differences in first-birth rates across educational pairings.

Second and Third Births

The most interesting findings emerge from the analyses of transitions to second and third births. In the pooled models, highly educated homogamous couples have the highest second- and third-birth rates (Figs. 2 and 3). Their rates are significantly higher than those of medium-educated homogamous couples as well as those of hypergamous or hypogamous couples with one highly educated partner only. Thus, there is a clear differentiation in second and third-birth rates within her or his high education conditional on the education of the partner.

For second-birth rates, when differentiated by country group, this general pattern is prevalent in Western and Eastern Europe. In the Nordic and the Southern groups, we find no significant differences between highly educated homogamous and hypogamous couples with a highly educated woman. Here, her education seems to be predicting second-birth rates regardless of his education. Yet, highly educated homogamous couples have higher second-birth rates in these two country groups than hypergamous couples with a highly educated man and a lower-educated woman.

Third-birth rates of highly educated homogamous couples are significantly higher than those for the other depicted pairings in Western Europe. In Eastern and Northern Europe, highly educated homogamous couples also have the highest third-birth rates, yet only the difference with hypogamous couples is significant. In Southern Europe, we find no significant differences between highly educated homogamous couples and hypergamous or hypogamous couples.[4]

Discussion of Hypotheses

The associations described in this article shed light on the validity—at least in contemporary European societies—of six specific hypotheses that we derive from five theoretical approaches. Hypotheses 1–3 represent the main arguments of the Beckerian economic model of the family. They predict that hypergamous couples have the highest (H1) and hypogamous couples have the lowest (H3) parity progression rates, while homogamous couples are expected to have lower progression rates than other couples at higher parities (H2). Our pooled results clearly run against these three hypotheses. Hypergamous couples have

[4] The predicted values of the second- and third-birth rates for Eastern Europe are lower than expected based on period fertility rates for the late 2000s. This appears to be due to attrition issues in the EU-SILC in some countries, particularly in the Eastern European subsample (Greulich and Dasré 2017). This attrition, however, has been shown not to be dependent on socioeconomic status; therefore, our results contrasting birth rates of educational pairings should be consistent and valid, even though overall birth rates are too low (Greulich and Dasré 2017).

significantly lower parity progressions to second and third births compared with highly educated homogamous couples, contradicting H1 and H3. Parity progressions to second and to third and higher-order births are highest for highly educated homogamous couples than for all other groups, including the lower-educated groups not shown in the tables. This contradicts H2. Although hypogamous couples have significantly lower progression rates to second and third births than highly educated homogamous couples, they do not differ from hypergamous couples. Testing their hazard rates against each other (Tables 6 and 7) shows no significant differences at the .10 level. Hence, our evidence does not support H2. Overall, our findings from the pooled models are not in line with the predictions that we derived from the Beckerian economic model of the family. Our findings suggest that theoretical approaches beyond the NHE are needed to fully understand current childbearing behavior across Europe, even though Becker's approach may still be applicable to third-birth progressions in Nordic and Eastern European countries.

Instead, our findings are consistent with H4 (pooling) and H5 (value consensus). Leaning on Oppenheimer's research, H4 predicts highest parity progression rates for highly educated homogamous couples because of a pooling effect of both partners' resources to a collaborative partnership. More precisely, H5 predicts higher parity progression rates for those "power couples" than for hypogamous couples with a highly educated woman and lower-educated man, based on the idea that value consensus in these couples implies his support for her combining of career and child-rearing. Our findings provide evidence in support of H4 and H5 regarding second and third and higher-parity progression rates, echoing previous results for Sweden of higher second- and third-birth rates for these couples (Dribe and Stanfors 2010). The evidence regarding entry into parenthood is more nuanced because the differences between pairings depend on her age, suggesting timing effects. These power couples display significantly higher rates of first births after her age of 29 than the other couples, confirming that highly educated homogamous couples make the transition to parenthood later than all other types of couples. Corijn et al. (1996) also found slower first-birth transitions for highly educated homogamous couples in Flanders and the Netherlands. Their sample, however, included only couples with women age 30 or younger, enabling them to capture the initial postponement but not their higher rates at later ages. Although we find that both partners' educational attainment and their interactions are important for predicting first-birth timing, it remains unclear why some couples postpone the first birth more than others. Next to different ages at union formation and diverse career pathways, varying preferences regarding the investment couples want to make into their children (i.e., quality-quantity considerations) could also guide the extent of postponement. For instance, highly educated homogamous couples may postpone the first birth the most in order to accumulate more resources before becoming parents. If so, Becker's quality-quantity reasoning may be partly supported by our findings, at least with respect to first-birth timing. Further research will need to explore these aspects behind postponement differences as well as the extent to which it may affect the probability of becoming parents at all across the different pairings.

The third mentioned theoretical framework—the bargaining perspective—is overall not supported by results from the pooled models, at least not in the way that we specified it. From a broadened perspective, however, bargaining may still take place among partners in ways that affect fertility beyond what we specified in H6 (bargaining). For instance, highly educated women in hypogamous couples may be more successful in bargaining greater focus on and investments in their careers (such as enforcing geographical mobility of the couple for a career advancement). Such employment involvement and investments may thus lead to the postponement (or forgoing) of a second child. From the men's perspective, it may be easier to bargain for a larger family involvement of the female partner when he has at least as much education and earning potential as she; hence, birth risks could be expected to be higher in hypergamous or highly educated homogamous couples than in hypogamous couples. Ultimately, more detailed data will be needed for empirical exploration of such nuanced bargaining channels and deeper discussion and specification of the bargaining concept in future research. That said, the findings for second-parity progressions in the Nordic and Southern European countries are actually consistent with H6 (bargaining), which predicts that hypogamous along with highly educated homogamous couples have highest parity progression rates. Bargaining may thus be taking place, or a mix of both pooling and bargaining may facilitate the decision to have a second child (sooner) for couples in these country groups. In the Nordic cluster, third-birth rates are, however, lower among hypogamous couples compared with homogamous, highly educated couples and hypergamous couples.

Couple dynamics, hence, seem to matter in the North of Europe, especially beyond the first birth. We expected couple dynamics to matter the least in the Nordic system of high public support for families for first and second births. This seems to be confirmed for the transition to parenthood but not for second or higher parities. This finding may hint at the importance of economic conditions for continued childbearing and underscores the need for further research to investigate more deeply the underlying mechanisms driving the differential birth progressions by educational pairings, specifically in a comparative perspective.

In the Southern countries, first-birth progressions are similar among all couples with one or two highly educated partners, and second-birth progressions are predicted by her educational attainment, again supporting H6 (bargaining). Thus, bargaining and pooling may take place in these countries with very little public support for work-family reconciliation. Interestingly, pooling resources in this scenario may facilitate the reconciliation between paid work and family life (Mencarini and Vignoli 2018), specifically among highly educated women who may successfully bargain for more support with domestic work. Yet, we do not find significant partner effects for third-birth progressions in the South.

In Western-European countries, differences between highly educated homogamous couples and the other couples are the largest. As expected, we find strong evidence for H4 and H5 (pooling and values) regarding second- and third-parity progressions. Pooling or value consensus thus appears to play a role, particularly for considerations of adding children to the family after the first birth has occurred in this setting with medium-level support for work-family reconciliation.

Eastern Europe shows some evidence for what may be a distinct pattern for entry into parenthood. Hypogamous couples have the highest transition rates across all ages, even though differences with highly educated homogamous couples are not significant at other ages than women's mid-20s and their mid-30s. One possible interpretation is that women's earning potential may matter more for family formation in Eastern Europe than in the other contexts, perhaps because of longer histories of women's labor force participation and institutionalized acceptance of women as income providers (e.g., Matysiak and Vignoli 2013). Furthermore, we find clear evidence for H4 and H5 (pooling and values) regarding second- and third-birth progressions. This finding is in line with our expectations given that dual earning in Eastern Europe may matter more for maintaining families, achieving higher living standards, and purchasing childcare in low public provision settings than in the old EU member states. Additionally, the third-birth progression rate for hypergamous couples is on par with highly educated homogamous couples. Perhaps some selected couples (e.g., those who are more affluent) may realize higher family sizes by adhering to a traditional division of labor, particularly in a setting where the combination of paid work and family is poorly supported by the state and women are still perceived as main childcare providers.

Conclusions

In light of rapidly changing sex ratios in higher education, changing gendered structures of labor markets, and the relevance of the couple-context for childbearing decision-making, we argue that the importance of extending the literature on the fertility-education relationship by investigating whether there are significant differences in how individuals' educational attainment relates to childbearing behavior conditional on the education of their partner. While a handful of (mostly) single-country studies have previously investigated this question—mainly with respect to the transition to parenthood—no representative multicountry study covering a broad array of country clusters yet exists on how partners' educational pairings relate to parity-specific birth transitions. Our study starts closing this gap by using data from the EU-SILC to estimate how partners' educational pairings predict parity-specific transitions to first, second, and third and higher-order births in 24 European countries, pooled as well as differentiated by country group. We estimate transition rates for all combinations of couples with low, medium, and high education of each partner. We focus on the results for couples that include partners with at least medium-level education, being particularly interested in differences by partner's education among highly educated women and men.

Two major findings come to the forefront. First, we show that both her and his education significantly predict first-, second-, and third-birth rates, suggesting that educational levels of both partners need to be considered when examining fertility. In some contexts, modeling partners' educational pairings, beyond modeling his and her education additively, further improves model fit for first and third and higher-parity birth progressions. Although this finding does not

apply to second-birth progressions, we nonetheless find significant interaction effects between the partners' education among couples with at least one highly educated partner in the second-birth models. Second, highly educated homogamous couples display significantly higher second- and third-birth rates than hypogamous or hypergamous couples (involving at least one highly educated partner) or medium-educated homogamous couples, at least in the pooled model. In addition, highly educated homogamous couples make the transition to parenthood later than these other couple types. That highly educated women have their first child late is no surprise, but the finding that the timing also depends on the educational level of the male partner is novel. Our results add complexity to our understanding of first births given that educational pairings significantly differ only contingent on the woman's age. All these findings are robust to several robustness checks, including different age specifications, single-country models, and checks for left-censoring by lowering the age limits from 40 to 33.

Overall, our results for second-birth progressions are most in line with Oppenheimer's pooling hypothesis and with the hypothesis that values and ideology of the partners play a role for childbearing decision-making. They do not support predictions derived from Becker's family model. The evidence for third births is similar but more nuanced: Becker's hypotheses may still partly apply in the Nordic countries and Eastern Europe. Goldscheider et al. (2015) argued that the emerging pattern of two-breadwinner families with two adults contributing to housework and childcare will lead to increases in fertility, marking the "second part" of the gender revolution. Ultimately, such developments may even lead to a reversal in the educational gradient in fertility, as others have hypothesized (Esping-Andersen and Billari 2015). At first sight, our results appear to support these claims: couples with two highly educated partners often display the highest second- and third-birth hazards, and our findings appear to indicate such a reversal, at least from a period perspective. We want to stress that these hunches are not necessarily supported by our results. Population-level fertility rates and education gradients in completed fertility represent a final outcome, which emerges based on various puzzle pieces coming together on the micro and meso levels, such as (gendered) education distributions, partnering behaviors, assortative educational mating, and differences in union stability. Much of the macro-level educational gradient in women's fertility is due to education differentials in childlessness (Beaujouan et al. 2015). The lack of a stable partnership has been cited as one of the chief reasons for forgoing motherhood (Tanturri and Mencarini 2008), the effect of which may be exacerbated among the highly educated as a result of limiting fertility more strictly when a stable partner is not present (Musick et al. 2009). The couple-level dynamics we have uncovered are certainly an important additional factor in shaping macro-level fertility rates and deserve more prominence in modeling and forecasting fertility behaviors. However, our data are for coresidential couples only. This puzzle piece of differentials in second- and third-birth rates between educational pairings may counterbalance, but likely not outweigh, other factors (such as selection into parenthood, or stable unions) in

producing macro-level fertility gradients. We find that highly educated homogamous couples postpone the first birth the longest. Yet again, we cannot say whether this finding implies a quantum effect and thus higher rates of forgoing parenthood altogether compared with other couples. If such postponement indeed implies greater chances of forgoing the first birth, this may imply higher rates of childlessness among partnered women in such unions and offer an additional pathway into childlessness among the highly educated. Future research would be needed to explore this connection.

Additionally, we note that our findings may imply that low-educated individuals and couples (not the focus of our analyses) may emerge as a particularly disadvantaged group in family formation processes. If highly educated individuals are more attractive in the mating market, and highly educated couples display higher fertility (possibly because they are better positioned to combine gainful employment and child-rearing), then couples with low combined educational attainment may be those with the greatest social and economic barriers to realizing their fertility desires. Because the focus in the couple-centered literature to date has focused on the more highly educated segment, we suggest that a closer look at how couples with low combined levels of educational attainment fare would be worthwhile.

As mentioned earlier, our study has its limitations. We are not able to determine timing from quantum effects. Thus, we are able to assess significant differences in parity progressions between the educational pairings, but we cannot know whether these will translate into higher completed fertility or are due to higher tempo, or both. Possible timing effects of first births may hinge on a systematically different timing of union formation across the educational pairings because we are unable to control for relationship duration with the EU-SILC data. Possible timing effects of second and higher-parity births may be based on the effect of the differential first-birth timing, which then perhaps gets carried on by specific educational pairings into those parity progressions. In other words, highly educated homogamous couples who postpone the first birth may eventually progress to second and/or third births faster given that they have fewer fertile years left to have additional children. This would, in turn, imply that such a time squeeze effect occurs in a more differentiated way than previously known because it may apply specifically to highly educated homogamous couples who appear to postpone the first birth longest. Furthermore, the high second or higher-order birth rates among highly educated homogamous couples might be a result of the selection of family-oriented highly educated partners into the group of parents or stable unions. Previous research has suggested that such a selection of family-oriented women into parenthood indeed inflates second-birth transition rates among highly educated women (Gottard et al. 2015; Kravdal 2001; Kreyenfeld 2002). In this vein, our findings could hinge on differential fertility preferences of her and him by education or by educational pairing of the couple. Finally, the regional context and region-specific hypotheses that we offer remain purely descriptive and interpretational. More research and more complex modeling will need to address which of the

structural macro-level factors we mention actually significantly relate to the regional differences in educational-pairing specific progression rates.

The picture of educational pairings and parity-specific fertility provided in this study yields new insights that should stimulate future studies with more detailed data with more completed cohort fertility information. Ideally, such data should also contain in-depth measures on couple dynamics, including partnership histories, characteristics of previous partners, measurements of relationship conflict and satisfaction, and fertility preferences of both partners. Such data would allow us to verify whether our findings are based on timing, quantum, or selection effects and to identify the mechanisms behind those patterns. Mechanisms behind our findings could be rooted in differential fertility preferences or differential experiences with child-rearing between the educational pairings. For instance, little is known about differences in fertility preferences by education, especially with regard to fertility desires early in the life course (and subsequent education) and changes in fertility desires over time and with changing educational attainment. Existing studies have suggested no gradient in the desired number of children early in the life course by subsequent educational attainment (Berrington and Pattaro 2014; Musick et al. 2009), although one study did find a positive educational gradient on fertility intentions using cross-sectional data (Testa 2014). Furthermore, fertility desires and intentions can change during the life course. Specifically, the parenting experience of the first (and second) child could cause upward or downward adjustments in the future desired number of children; for instance, a recent study suggested that parental well-being surrounding the first birth is a determinant of further parity progression (Margolis and Myrskylä 2015). Hence, if couples with two highly educated partners have a more positive parenting experience with the first (and second) child—perhaps because of better access to resources relevant for child-rearing—they may develop a stronger desire for having more future children than couples with less positive experiences. Although our findings are novel and support certain hypotheses but not others, ultimately testing or speaking to the underlying mechanisms will need to be examined by future research. Unfortunately, the data needed to address all our limitations are currently not available for a broad set of (European) countries. This lack of data hinders cross-country comparisons and thus precludes the understanding of how structural social context may affect the relationship between partners' socioeconomic resources and childbearing.

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Appendix

Table 5 First-birth transitions, by her and his education: All countries pooled and by country group

	First-Birth Hazards									
	Pooled		Northern		West		Southern		Eastern	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Education										
Both high	0.550**	0.093	0.950**	0.215	0.268†	0.137	0.232	0.226	0.902**	0.280
Hers high, his lower	0.380**	0.100	0.710**	0.226	0.165	0.154	–0.013	0.227	0.842**	0.289
His high, hers lower	0.235†	0.132	0.606*	0.295	0.008	0.196	0.360	0.312	0.193	0.389
Both medium (ref.)[a]										
Both low	–0.295†	0.163	–1.140†	0.692	–0.154	0.315	–0.391†	0.231	–0.305	0.691
Hers medium, his low	–0.035	0.149	–0.014	0.409	0.035	0.270	–0.121	0.226	–1.425	0.926
Hers low, his medium	–0.564**	0.191	–0.545	0.453	–0.608†	0.347	–0.545†	0.314	–0.784	0.717
Both high × Age	0.125**	0.019	0.128**	0.047	0.165**	0.028	0.027	0.061	0.022	0.063
Hers high, his lower × Age	0.046*	0.018	0.068	0.046	0.050†	0.026	0.034	0.052	0.075	0.052
His high, hers lower × Age	0.007	0.023	0.050	0.056	–0.031	0.039	0.023	0.070	0.047	0.074
Both low × Age	–0.012	0.024	–0.130	0.190	–0.099†	0.057	–0.040	0.036	–0.156	0.156
Hers medium, his low × Age	–0.022	0.027	–0.050	0.111	–0.042	0.047	–0.074†	0.041	–0.474	0.349
Hers low, his medium × Age	–0.017	0.028	0.054	0.079	–0.028	0.048	–0.087†	0.050	0.018	0.099
Both high × Age squared	–0.018**	0.004	–0.019*	0.009	–0.018**	0.005	0.000	0.012	–0.035**	0.013
Hers high, his lower × Age squared	–0.001	0.003	–0.002	0.008	0.001	0.005	0.001	0.010	–0.001	0.010
His high, hers lower × Age squared	–0.005	0.004	–0.011	0.010	–0.008	0.007	–0.004	0.013	0.005	0.011
Both low × Age squared	0.007†	0.004	–0.001	0.018	–0.006	0.008	0.017**	0.006	–0.006	0.015
Hers medium, his low × Age squared	–0.006	0.004	–0.013	0.015	–0.011	0.008	0.008	0.007	–0.048	0.037
	0.008†	0.004	0.011	0.010	0.007	0.007	0.012	0.009	0.016	0.013

Table 5 (continued)

	First-Birth Hazards									
	Pooled		Northern		West		Southern		Eastern	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Hers low, his medium × Age squared										
Age	–0.099**	0.012	–0.110**	0.035	–0.090**	0.018	–0.053*	0.024	–0.173**	0.033
Age Squared	–0.011**	0.002	–0.019**	0.005	–0.009**	0.003	–0.015**	0.005	–0.012*	0.005
Enrolled	–0.725**	0.114	–0.481**	0.162	–1.239**	0.268	–0.666†	0.370	–0.851*	0.342
Partner Enrolled	–0.869**	0.173	–0.731**	0.224	–0.781*	0.351	–1.169	0.885	–1.605*	0.671
Relative Age	–0.033**	0.006	–0.021	0.014	–0.035**	0.009	–0.042**	0.013	–0.033†	0.018
Cohabiting	–0.939**	0.064	–0.657**	0.127	–0.818**	0.091	–1.103**	0.176	–1.595**	0.205
Constant	–1.414**	0.107	–1.584**	0.238	–1.770**	0.178	–1.301**	0.197	–2.605**	0.301
Number of Couple-Years	25,960		6,072		9,181		4,489		6,218	

Note: Models control for year and country dummy variables.

[a] Also in the interactions with Age.

†$p \leq .10$; *$p \leq .05$; **$p \leq .01$

Table 6 Second-birth transitions: All countries pooled and by country group

	Second-Birth Hazards									
	Pooled		Northern		West		Southern		Eastern	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Education										
Both high	0.543**	0.069	0.303†	0.171	0.504**	0.101	0.656**	0.187	0.860**	0.177
Hers high, his lower	0.265**	0.070	0.325†	0.173	0.137	0.110	0.414*	0.174	0.329*	0.168
His high, hers lower	0.083	0.092	–0.157	0.246	0.033	0.129	0.224	0.226	0.224	0.249
Both medium (ref.)[a]										
Both low	–0.320**	0.105	–1.344**	0.468	–0.218	0.173	–0.193	0.160	0.036	0.332
Hers medium, his low	–0.324**	0.099	–0.654*	0.316	–0.421**	0.162	–0.249	0.172	0.088	0.264
Hers low, his medium	–0.121	0.115	–0.006	0.309	–0.312†	0.188	–0.148	0.223	0.225	0.299
Age of Youngest Child	2.327**	0.114	3.190**	0.329	2.688**	0.178	1.616**	0.227	2.103**	0.270
Age of Youngest Child Squared	–0.330**	0.017	–0.452**	0.048	–0.409**	0.028	–0.212**	0.034	–0.277**	0.039
Age at First Birth	–0.064**	0.006	–0.109**	0.019	–0.051**	0.009	–0.037**	0.014	–0.084**	0.017
Enrolled	–0.348*	0.144	–0.543*	0.227	–0.544†	0.328	–0.337	0.673	–0.017	0.382
Relative Age	–0.017**	0.006	–0.039*	0.016	–0.026**	0.008	0.002	0.012	–0.002	0.014

Table 6 (continued)

	Second-Birth Hazards									
	Pooled		Northern		West		Southern		Eastern	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Cohabiting	–0.395**	0.058	–0.464**	0.129	–0.299**	0.079	–0.468*	0.195	–0.781**	0.174
Constant	–3.712**	0.274	–2.375**	0.633	–3.593**	0.384	–3.907**	0.615	–4.514**	0.670
Number of Couple-Years	26,045		4,469		7,143		5,373		9,060	

Notes: Models control for year and country dummy variables. Test results are as follows:

Pooled: *Both high* and *Hers high, his lower* = 0 chi-squared = 15.06 (p = .0001). *Both high* and *His high, hers lower* = 0 chi-squared = 23 ($p < .0001$). *Hers high, his lower* and *His high, hers lower* = 0 chi-squared = 3.42 (p = .0643).

Nordic: *Both high* and *Hers high, his lower* = 0 chi-squared = 0.02 (p = .8910). *Both high* and *His high, hers lower* = 0 chi-squared = 3.48 (p = .0622). *Hers high, his lower* and *His high, hers lower* = 0 chi-squared = 3.68 (p = .0552).

Western & Austria: *Both high* and *Hers high, his lower* = 0 chi-squared = 12 (p = .0005). *Both high* and *His high, hers lower* = 0 chi-squared = 13.47 (p = .0002). *Hers high, his lower* and *His high, hers lower* = 0 chi-squared = .58 (p = .4475).

Southern: *Both high* and *Hers high, his lower* = 0 chi-squared = 1.42 (p = .2333). *Both high* and *His high, hers lower* = 0 chi-squared = 2.94 (p = .0866). *Hers high, his lower* and *His high, hers lower* = 0 chi-squared = 0.59 (p = .4427).

Eastern: *Both high* and *Hers high, his lower* = 0 chi-squared = 7.75 (p = .0054). *Both high* and *His high, hers lower* = 0 chi-squared = 5.46 (p = .0195). *Hers high, his lower* and *His high, hers lower* = 0 chi-squared = .15 (p = .6969).

[a] Also in the interactions with Age.

$^{\dagger}p \leq .10$; $*p \leq .05$; $**p \leq .01$

Table 7 Third and higher-parity birth transitions: All countries pooled and by country group

	Third and Higher-Parity Birth Hazards									
	Pooled		Northern		West		Southern		Eastern	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Education										
Both high	0.539**	0.081	0.288†	0.150	0.581**	0.134	0.697*	0.301	0.631**	0.177
Hers high, his lower	0.136	0.093	0.033	0.161	0.049	0.166	0.293	0.321	0.106	0.206
His high, hers lower	0.254*	0.106	0.284	0.190	0.140	0.174	0.133	0.399	0.392	0.245
Both medium (ref.)										
Both low	0.378**	0.106	–0.920†	0.471	0.279	0.179	0.292	0.246	0.993**	0.220
Hers medium, his low	0.430**	0.104	0.480*	0.202	0.229	0.188	0.106	0.284	0.685**	0.222
Hers low, his medium	0.426**	0.107	–0.064	0.255	0.357†	0.187	0.238	0.321	1.080**	0.192
Age of Youngest Child	1.378**	0.108	1.360**	0.211	1.587**	0.185	1.041**	0.334	1.134**	0.236

Table 7 (continued)

	Third and Higher-Parity Birth Hazards									
	Pooled		Northern		West		Southern		Eastern	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Age of Youngest Child Squared	–0.211**	0.018	–0.210**	0.034	–0.246**	0.030	–0.145**	0.052	–0.169**	0.037
Relative Age	0.006	0.006	0.017	0.013	–0.015	0.011	0.001	0.019	0.020	0.012
Enrolled	0.062	0.204	–0.088	0.251	–0.061	0.525	1.723	0.847	0.612	0.604
Age at First Birth	–0.046**	0.007	–0.038**	0.014	–0.080**	0.013	–0.044*	0.022	0.004	0.017
Cohabiting	–0.077	0.070	–0.051	0.117	–0.219	0.119	–0.540	0.439	–0.028	0.157
Constant	–4.577**	0.288	–3.965**	0.501	–3.042**	0.443	–4.545**	0.913	–5.803**	0.649
Number of Couple-Years	45,296		9,865		12,202		6,964		14,626	

Notes: Models control for year and country dummy variables. Test results are as follows:

Pooled: Both high and Hers high, his lower = 0 chi-squared = 19.37 (p = .0000). Both high and His high, hers lower = 0 chi-squared = 7.19 (p = .0073). Hers high, his lower and His high, hers lower = 0 chi-squared = 1.01 (p = .3147).

Nordic: Both high and Hers high, his lower = 0 chi-squared = 2.77 (p = .0959). Both high and His high, hers lower = 0 chi-squared = 0.00 (p = .9823). Hers high, his lower and His high, hers lower = 0 chi-squared = 1.60 (p = .2056).

Western: Both high and Hers high, his lower = 0 chi-squared = 11.72 (p = .0006). Both high and His high, hers lower = 0 chi-squared = 6.92 (p = .0085). Hers high, his lower and His high, hers lower = 0 chi-squared = 0.22 (p = .6399).

Southern: Both high and Hers high, his lower = 0 chi-squared = 1.31 (p = .2515). Both high and His high, hers lower = 0 chi-squared = 1.72 (p = .1894). Hers high, his lower and His high, hers lower = 0 chi-squared = 0.13 (p = .7181).

Eastern: Both high and Hers high, his lower = 0 chi-squared = 5.71 (p = .0169). Both high and His high, hers lower = 0 chi-squared = 0.82 (p = .3643). Hers high, his lower and His high, hers lower = 0 chi-squared = 1.01 (p = .3149).

$^{\dagger}p \leq .10$; $*p \leq .05$; $**p \leq .01$

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