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Abstract
Educational pairings, in other words the combination of educational levels of both partners, have been shown to have meaningful implications for couples' childbearing behavior. Specifically, in a variety of developed countries, second birth transition rates appear to be higher among homogamous highly educated couples than among heterogamous couples consisting of one highly educated partner and one lower educated partner. However, the mechanisms that underlie these findings are not well-understood. We extend this literature by proposing and testing three potential mechanisms. We investigate whether differentials in second birth rates by educational pairing are, first, an artefact created by overly broad education categories, which mask that these differentials are driven by 'low pooled resources' or 'large distance' couples; or, second, driven by the educational upgrading processes of the partners; or, third, due to unobserved heterogeneity among couples. Using data from Finnish registers, we indeed find that second birth rates are higher as the pooled resources of couples increase. However, we also find that differentials among the higher educated couples hinge upon 'low pooled resources' couples; meaning that the partner's education matters in predicting the risk of a second birth transition mainly if the partner has low tertiary education. Furthermore, we show that adding a common term across birth episodes to address unobserved heterogeneity renders most pairing differentials among the higher educated groups insignificant, while pairing differentials remain large and significant among the lower educated groups.

Keywords: Fertility, education, couples, second birth, resources, family formation

INTRODUCTION

In highly advanced societies, most co-residential couples are homogamous in terms of their educational resources (Grow and Van Bavel 2015). However, changing gender ratios in tertiary education have led to changes in assortative mating patterns. For instance, hypogamous couples with a highly educated female partner and a lower educated male partner have become more common (De Hauw et al. 2017, Esteve et al. 2016). Hypergamous male breadwinner couples, once widespread, are now on the decline (Esteve et al. 2016). This is particularly the case in countries where large proportions of women obtain tertiary education, such as Finland. These changes in educational assortative mating have spurred interest in examining their implications for childbearing behavior, because the implied changes in men's and women's economic roles in families are expected to affect childbearing choices (Van Bavel 2012). Furthermore, the issue of differentials in childbearing behavior between different *educational pairings* has attracted interest in its own right, even before significant changes in gender ratios in higher education occurred (e.g., Corjin et al. 1996, Dribe and Stanfors 2010). The partner's education appears to make a significant difference in the relationship between an individual's own education and his/her childbearing behavior, at least in some settings (Nitsche et al 2018, Trimarchi and Van Bavel 2019). Given the evidence that educational pairings are among the factors that contribute to gender differences in educational fertility gradients, investigating differential birth rates by educational pairing clearly has relevance in demography.

As a consequence, a growing number of studies of childbearing behavior have focused on couples, and specifically on the partners' joint educational resources and their implications. Recent research has demonstrated that the education of both partners plays an important role in the parity progression rates of couples, which underscores that the couple perspective and

both partners should be included in the analysis when investigating fertility in general, and the fertility-education nexus in particular (Nitsche et al. 2018). For instance, it appears that second and third birth rates are higher among couples consisting of two highly educated partners than they are among couples consisting of one highly educated partner and one lower educated partner in a variety of European societies (Nitsche et al. 2018). This pattern has been detected by several studies, and has been shown to be significant and widespread (Dribe and Stanfors 2010, Nitsche 2017). However, while there is clearly significant variation in fertility trajectories depending on whether the educational levels of the partners in a couple are the same or different, the mechanisms that produce such differential birth rates by educational pairing remain unclear. Previous studies have largely framed this variation in terms of economic theories of the family and 'gender revolution' perspectives, suggesting that factors such as gender-egalitarian attitudes and the gendered division of work, cumulative economic resources, union stability, and rates of entry into parenthood may be among the drivers. However, the specific mechanisms that underlie the fertility differentials between educational pairings have rarely been tested (Nitsche 2018, Nitsche et al. 2018, Dribe and Stanfors 2010).

We extend the literature by proposing and testing three mechanisms that may be driving differentials in second birth rates by educational pairing, two of which relate to and call into question the conceptualizations and measurements of educational attainment that are typically used. First, previous studies have grouped all tertiary educated individuals into the 'highly educated' category, which could produce the results of elevated second birth risks among homogamous highly educated couples as an artefact. Specifically, the group of tertiary educated individuals is continuously increasing, and is becoming more diverse (Barro and Lee 2013), which likely implies that socioeconomic and ideational differences between high-medium and high-low educational pairings are growing over time. Thus, hidden heterogeneity

within the group of highly educated individuals may mean that studies showing that today's heterogamous couples have lower birth rates are capturing only the 'tip of the iceberg' in terms of heterogamy, and are thus exaggerating differentials in birth rates. To test this possibility, we use a finer grained education categorization that differentiates between lower and higher levels of tertiary education.

The second mechanism concerns the partners' upgrading of their level of education during the partnership. One potential reason for educational heterogamy is that the lower educated partner has not yet finished his/her studies, which implies that the heterogamy is temporally limited. Therefore, the lower risks of second births among heterogamous couples may reflect a tendency to postpone the second birth until both partners have earned their degrees. We examine the role of such *educational upgrading*.

Third, we test whether variation in second birth rates by educational pairing may be due to unobserved heterogeneity across birth episodes at the couple level. We implement this hypothesis by estimating the transition to parenthood and second births jointly, and incorporate a frailty term at the couple level to control for unobserved drivers and differential entry rates into parenthood by educational pairing. Unlike in previous studies, we consider all couples formed by the women in the sample; i.e., we also include couples who split up. While previous research has acknowledged that differential rates of union dissolution by educational pairing may be one reason for the variation in second birth progression rates, these studies did not test this possibility directly. Using data from Finnish registers featuring complete histories of coresidential partnerships and childbearing and event-history modeling, we find that the higher the couples' joint educational capital, the higher the likelihood of transitioning to a second birth, even after unobserved heterogeneity, educational upgrading, and a finer grained definition of tertiary education have been accounted for.

BACKGROUND AND HYPOTHESES

Couples, childbearing, and educational pairings

The importance of using the couple as the unit of analysis has become increasingly acknowledged in fertility research, and for good reason. Most children are born within co-residential partnerships (Perelli-Harris et al. 2012); and the lack of a partner is coming to the fore as one main reason for childlessness (Jalovaara and Fasang 2017, Keizer et al. 2008). Thus, it is clear that selectivity into unions is relevant for fertility trajectories, and that reproductive decision-making will often involve two partnered adults Educational trajectories are among the most important correlates of fertility behavior (Kravdal and Rindfuss 2008, Balbo et al. 2013). Recent studies have demonstrated that how an individual's educational attainment is related to his/her fertility trajectory will partly depend on the education of his/her partner (e.g., Trimarchi and Van Bavel 2017, 2019, Nitsche et al. 2018, Osiewalska, 2017, Dribe and Sanford 2010). Thus, the couple perspective is relevant not only for understanding fertility behavior in general, but for engaging in a deeper investigation of the fertility-education nexus in particular. Existing couple-level studies focusing on the partners' education have framed their analyses in terms of economic considerations, such as resource sharing, opportunity costs, gender roles, and work-family compatibility. Those studies derived their hypotheses regarding how educational pairings will predict couples' birth progressions based on arguments from the New Home Economics (Becker 1981) or Oppenheimer's ideas about resource pooling (Oppenheimer 1997). While some studies have focused on couples' transitions to parenthood and their probability of remaining childless (Bauer and Jacob 2010; Corijn et al. 1996; Jalovaara and Miettinen 2013; Wirth 2007, Osiewalska 2017), others have examined the transitions to second and third births (Dribe and Stanfors 2010, Nitsche et al. 2018, Nitsche 2017). The conceptualization of the partners' joint resources in these studies

also varies. Most examined educational pairings only, while others combined information on education with information on the field of study (Trimarchi and Van Bavel 2019), occupational status (Osiewalska 2017), or income (Dribe and Stanfors 2010). How education is measured and how enrolment in education is controlled for in these studies has also varied. The findings of this small number of studies are mixed for first births, but are more consistent for second or higher order birth progressions. Couples with two highly educated partners were found to have higher second (and third) birth progression rates than couples with one highly educated partner and one lower educated partner in Sweden, across a pooled European sample, and in Germany (Dribe and Stanford 2010, Nitsche et al. 2018, Nitsche 2017). While these studies suggested that resource pooling, reduced perceived unemployment risks, and greater gender equality in the division of paid and unpaid work are among the potential mechanisms for the elevated second birth rates among such 'power couples', they did not test these mechanisms directly. Moreover, as most of these studies used event-history methods, it remains unclear whether these are timing or quantum effects. One study used stepwise models to investigate the mediating effect of the division of unpaid work in a German sample. The results showed that these differentials in second birth rates between homogamous highly educated and other couples remained robust, and did not appear to be driven by the gendered division of work (Nitsche 2017). However, no previous study on this topic has differentiated between low and high tertiary education, or incorporated a measure of whether a couple experienced the educational upgrading of one or both partners during the study period.

Educational pairings and the classification of education

Given the rapid expansion of education, large percentages of the current populations of many developed nations have attended tertiary education (Schofer and Meyer 2005, Barro and Lee

2013). In Finland, for instance, around 45% of 35-44-year-olds in 2018 had received some type of tertiary education (online source 1), up from around 36% in 2000 (online source 2, own calculations). Thus, the group of individuals who are classified as 'highly' educated (based on the standard educational classifications of low, medium, and high or tertiary) has become increasingly large and diverse over time. We argue that given this diversity and the large size of the tertiary educated group, a more nuanced distinction should be made between lower and upper tertiary education. It is, for example, likely that the earning potential and the employment participation levels vary significantly between these two groups, which may have implications for couples' childbearing decisions (Statistics Finland 2020). In heterogamous couples in which one partner has secondary (medium) education and the other partner has lower tertiary education, the differences between the partners in terms of income, earning potential, social background, capital, and values may be much smaller than they are in a couple in which one partner has higher tertiary education and the other has secondary education. Nonetheless, previous studies have mostly grouped all hypogamous or hypergamous couples that included one tertiary educated partner and one lower educated partner together, regardless of those more nuanced differences. Thus, these studies may have overlooked potential diversity not only within the group of tertiary educated individuals, but within those heterogamous couples in which one partner was highly educated while the other had secondary or basic education (e.g., Nitsche et al, 2018). Couples consisting of one partner with tertiary education and one partner with low education are rare, and cannot be examined as a separate group in analyses based on survey data due to their small sample sizes. It is, however, possible that the lower second (or third) birth progression rates of heterogamous couples are driven by these '*large distance*' couples (e.g., one partner has upper tertiary education and the other has secondary or basic education). Heterogamy along cultural or

socioeconomic dimensions such as religion, nationality, social value orientation, and social background, which can accompany educational heterogamy – has been theorized and empirically shown to be potentially detrimental to union stability (Kalmijn et al. 2005, Schwartz 2010) and the progression to marriage (Trimarchi and Van Bavel 2018). In Finland, cohabiting couples in which the educational attainment gap between the partners was greater were more likely to break up (Mäenpää and Jalovaara 2014). Therefore, the higher union dissolution rates of these '*large distance'* couples – in combination with phases of lower relationship satisfaction and investments preceding the dissolution while still in the union – may contribute to the lower birth progression rates of heterogamous couples.

Alternatively, second (or third) birth progression rates may be lower in heterogamous couples that include one partner with lower tertiary education because of their lower overall economic resources ('*low joint resource couples'*), based on the assumption that having sufficient joint socioeconomic resources is crucial to stimulating second births (Oppenheimer 1997). This argument also implies that the high second birth rates of homogamous highly educated couples are particularly driven by homogamous upper tertiary ('*elite*') pairing – i.e., by the partners having high earning potential, gender -egalitarian attitudes, high social capital, and high levels of union stability – while the second birth rates of upper-lower tertiary pairings are likely to be in between those of the other two groups. Thus, differential birth rates between educational pairings that include one or two partners with tertiary education may be an artefact that is partly produced by standard education categorizations into three broad categories. In other words, differentials in birth rates between couples with two partners with upper tertiary education ('*elite couples'*) and couple combinations with upper and lower tertiary education may be present, but masked in the standard classification. Looking more closely at a sufficiently large sample will enable us to understand such finer grained dynamics. To sum up,

the following first hypothesis, derived from theoretical arguments regarding the implications of 1a) homogamy versus heterogamy and 1b) pooled socioeconomic resources, emerges:

Hypothesis 1: Differences in second birth rates between couples with two tertiary educated partners and heterogamous couples with one tertiary and one medium educated partner are an artefact driven by overly broad or imprecise education classifications (H1 artefact).

Hypothesis 1a: Among heterogamous couples that include one highly educated partner, second birth rates are lower mainly in pairings in which there is a 'large distance' between the partners' educational levels, because these couples are likely to have the highest chances of value mismatch or union dissolution (H1a distance).

Hypothesis 1b: Among heterogamous couples that include one highly educated partner, second birth rates are lower mainly in pairings in which one partner has lower tertiary education (and one has secondary or basic education), because they have lower pooled economic resources. At the same time, 'elite couples' will have the highest second birth rates, and upper/lower tertiary combination couples will have second birth rates that lie in between those of the other two groups (H1b pooling).

Previous research has, for example, found that the second birth rates of homogamous medium educated couples remained below those of couples with one or two tertiary educated partners in some European contexts (Nitsche et al. 2018; Trimarchi and Van Bavel 2019); and that pairings with low-medium education combinations had lower second birth progression rates and higher union dissolution risks in Sweden (Dribe and Stanfors 2010). Therefore, we can expect to observe declining second birth risks by joint socioeconomic capital among lower educated couples in Finland. This would provide further evidence of the relevance of resource pooling in couples for fertility.

Educational pairings and upgrading

Childbearing is a dynamic process in life. Couples generally plan the timing of births, even though conception and pregnancy outcomes are not always within the scope of the partners' agency (Thompson and Hoem 1998, Sweeny et al. 2015, Hohmann-Marriott 2009). It is well-known that some couples will postpone the transition to parenthood or to another birth for a variety of reasons, such as economic or employment considerations (Gustafsson 2001, Mills et al. 2011). While having a child while enrolled in education is not common, it does occur, and it has been occurring at increasing rates, at least in the US (Kuperberg 2009). The average age at the completion of tertiary education varies across countries, and is declining across Europe due to the Bologna reform (OECD 2014). However, in some countries, such as in Finland, the average age at college graduation was high in the past, and remains high today (OECD 2016). Currently, the average age at which Finns earn their first university degree is 25–27, and the average age at which they earn a post-graduate degree is around age 30 or older (ibid.). The later in the life course an individual completes his/her education, the more his/her childbearing and educational processes may overlap. The period of time when an individual is enrolled in tertiary education – and particularly towards the end of this period, when most coursework is finished – is generally characterized by a high degree of time flexibility, and may be perceived as a good time to make the transition to parenthood (Mason et al. 2013). This is especially likely to be the case if the other partner has already completed his/her education, and is employed with a stable income. Thus, for some couples, it may be an attractive option to make the transition to parenthood while one partner is still enrolled in education. Such a first birth would be classified as a birth to a heterogamous couple, as one partner has finalized his/her tertiary degree and is potentially employed, while the other is about to finalize his/her tertiary degree but is still enrolled in education, and is, therefore, officially 'medium' educated. Thus,

such a couple may postpone their second pregnancy to a time when the enrolled partner has completed his/her studies and entered the labor market, in part due to concerns about birth spacing, but also because parental leave benefits are tied to previously received earnings. While there is, to our knowledge, currently no representative evidence on how common such a childbearing trajectory is, Kravdal (2007) estimated that in Norway, 23% of mothers registered as highly educated at age 39 had made the transition to motherhood while they were still at the secondary education level. Hence, if a sizeable group of heterogamous couples in which one partner is tertiary educated and the other is enrolled in education have a first child, and postpone the birth of a second child until the lower educated partner has upgraded his/her education, a pattern could emerge that may explain some portion of the elevated second birth risk observed for homogamous highly educated couples. Thus, following the couple over time and modeling the upgrading process explicitly may reduce the birth rate differences between homogamous highly educated couples and heterogamous couples. Previous studies have controlled for the educational enrollment of the partners, but have not modeled education upgrading within the same couple. We suggest that such a childbirth-education upgrading sequence may be more applicable to couples in which the woman is enrolled (hypergamous couples), as she can combine her pregnancy and the maternity period with her studies. Also, male partners are typically older than female partners; thus, educational upgrading of the female partner after the first birth may be more common than upgrading of the male partner, simply for age related reasons. Hence, the second birth rate differential between hypergamous couples and homogamous highly educated couples in particular should decrease when modeling the upgrading mechanism.

H2: A hypergamous couple may be more prone to having their first child while the woman (or the man) is still enrolled in education, but they may turn into a homogamous highly educated

couple before having their second child. Therefore, differences between homogamous highly educated couples and hypergamous couples will shrink when we allow for educational upgrading (H2 Upgrading).

Educational upgrading will occur among lower educated couples as well. Nonetheless, we expect to find that the education upgrading mechanism applies primarily to differences in birth rates between highly educated homogamous and hypogamous couples, as they are more likely than lower educated couples to be enrolled in education into their prime childbearing years.

Unobserved heterogeneity

According to previous studies, the relationship between education and higher order births is difficult to measure due to the role of the selection into motherhood (Kravdal 2001; Kreyenfeld 2002; Kravdal 2007). Unobserved heterogeneity across birth orders may lead a selected group of highly educated mothers to have higher second or third birth rates than lower educated mothers. Thus, the educational gradient in higher order births may not necessarily represent a "clean" effect of education on fertility. This mechanism can also be extended to couples (Trimarchi and Van Bavel 2019). Thus, to observe a 'cleaner' effect of couples' educational pairing on higher order births, accounting for unobserved heterogeneity at the couple level is necessary. Among the unobserved factors that could affect fertility are the partners' fecundity and the partners' personality and physical traits. If differentials in birth rates between educational pairings are largely driven by such unobserved heterogeneity, these differences should become smaller when unobserved couple-level heterogeneity across first and second births is accounted for.

H3: If educational pairing differences are attenuated by jointly modeling the transition to parenthood and to the second birth when accounting for unobserved heterogeneity, such differences are likely driven by unobserved common factors at the couple level (H3 unobserved heterogeneity).

To date, there is no single country study for Finland on educational pairings among couples and second birth transitions. One study that used Finnish register data investigated the transition to parenthood by looking at the effects of each partner's income and education, as well as the interaction effects between the partners' resources. No interactive effects of the partners' education on the first birth hazard was found (Jalovaara and Miettinen 2013). However, differential first birth hazards by the partners' levels of education and income were present. The higher each partner's income was, the higher the transition rate to the first birth was. Even though the effect of the partners' resources did not interact significantly in this study, the results do suggest that couples with higher levels of joint resources have higher birth rates than couples with lower levels of joint resources. Therefore, we estimate a baseline model for Finland that predicts second birth hazards by the partners' educational pairings using standard event-history modeling, while adding to the literature descriptive evidence on first birth hazards by educational pairing.

Data and Methods

Data and sample selection

We use Finnish register data that include complete education, co-residential union, and childbearing trajectories. Finnish registers are exceptional, as since the late 1980s they have contained information on the place of residence down to the specific dwelling, which makes it

possible to link individuals to coresidential couples even when they are childless and unmarried (for details on the inference of unions, see Jalovaara & Kulu 2018). Starting with the cohort of women born in 1969, we observe records of all co-residential unions formed since age 18 and until age 39. The women in our sample were born between 1969 and 1990, and they formed their unions, in the period between 1985 and 2009 (N = 40,021). Women who did not enter a union during the observed time (N = 2,412) were dropped from the sample. Further, 6,827 women were dropped because they had their first child after September 2009, which is our censoring time. Our overall sample is comprised of 30,782 women who formed 46,270 unions. We censored couples in S eptember 2009, at women's emigration (if it occurred), or after 15 years since the beginning of a co-residential union, whichever came first. In the first step, in order to estimate second birth transitions by educational pairing without accounting for unobserved heterogeneity, we only kept unions in which a first child had been born; hence, we left out 16,185 unions that did not lead to a first birth during the observed time. From the remaining 30,085 unions, 312 unions were dropped from the analysis because of an inconsistent time to event (N =141 equal zero, N = 171, negative time). Overall, we are left with 29,773 unions at risk of a second birth and 28,139 women. Thus, for the basic second birth rate estimation, we consider all coresidential unions of mothers at parity one, regardless of their marital status, and including unions that ended before marriage or the birth of a child occurred. This allows us to account for the fact that some women have formed several unions that might or might not involve childbearing.

Main explanatory variables

We measure each partner's education at the time of union formation, and we account for changes in education over time. This implies that educational pairing is a time-varying

variable. Using the updated 2011 version of the Internal Standard Classification of Education (ISCED), we first collapse the partners' education into three main groups: low (ISCED-2011 levels 0–2: basic education or less), medium (ISCED-2011 3–4: upper secondary and vocational training), and high (ISCED-2011 5–8: first and second stage of tertiary education). We interact the partners' education to obtain the educational pairing variable measured in nine categories. Next, we use a more refined variable of educational pairing. The highly educated group is further subdivided into low tertiary educated (ISCED-2011 levels 5–6, including individuals with a bachelor's degree with a track that is typically vocationally oriented) and high tertiary educated individuals (ISCED-2011 levels 7–8, including individuals who obtained a higher tertiary or doctoral degree). Thus, the refined educational pairing variable resulting from forming all possible combinations of the partners' finer grained educational levels and consists of 4*4=16 categories.

The other main explanatory variable in our study is an indicator of educational upgrading; i.e., whether either of the partners obtained a higher level of education relative to her/his observed education at the time of starting the coresidential union. The variable presents four categories; for each couple, we defined whether both partners upgraded their level of education (1), only the man upgraded (2), only the woman upgraded (3), or neither of the partners upgraded (4).

Control variables

We add a number of control variables to the model. We control for 1) the woman's birth year, entered as a yearly dummy variable; 2) union cohort, which indicates the year when the union was formed and is measured in three categories: formed before 1995, between 1995 and 2000, after 2000; 3) marital status of the union; and 4) the partners' age difference as a three-

category variable. Here, we define partners with an age difference of less than two years as age homogamous, couples in which the man is at least two years older than the women as age hypergamous, and couples in which the woman is at least two years older than the man as age hypogamous. See Table 1 for a detailed description of the explanatory variables for all couples at risk of a second birth.

Analytical strategy

To test our hypotheses, our analytical strategy comes in two steps. First, we model the transition to a second birth by means of a standard piecewise exponential model on the sample of unions who are at risk of a second birth. Here, we run three models. The first model (specification 1) includes the nine-category educational pairing variable. The second model (specification 2) includes the refined 16-category educational pairing variable. The third model (specification 3) includes the upgrading variable using the detailed educational pairing measure with 16 categories. Given that we observe several unions per woman, we also specified models that clustered standard errors at the woman level to account for the non-independence of observational units (in our case, couples); however, our conclusions are substantially the same. Formally, the piecewise exponential model can be written as follows:

$$\log(\lambda_{ij}) = \alpha_j + x'_i\beta$$

where $\log\lambda_{ij}$ is the log of the hazard of couple *i* in interval *j*; α_j is the log of the baseline hazard, which is assumed to be constant within each interval considered; and $x'_i\beta$ is the relative risk for a couple with that specific covariate profile (including both time-constant and time varying covariates), compared to the baseline, at any given time. In our models, the time process of the transition to the second birth is measured as the duration since the previous birth

until conception (birth minus eight months). Our baseline duration is measured in eight intervals (0–2 years since last birth, 2–3, 3-4, 4–5, 5-6, 6–7, 7–10, 10+).

In the second step, we apply a model for recurrent events in which birth episodes are nested within couples. This allows us to control for time-constant unobserved factors correlated across birth episodes for each couple formed by the women in our sample. To do so, we use a sample of all women and their unions who were at risk of a first birth at the beginning of our observational period, in addition to the sample at risk of a second birth utilized previously (N women= 48055 ; N couples = 70331). This piecewise exponential model with an unobserved random effect can be written as follows:

$$\log\lambda_{ij} = \alpha_j + x'_i\beta + \nu_i$$

where ν_i is the unobservable random effect across couples' first and second birth episodes, which is assumed to be normally distributed with mean zero and variance $\int^2$ to be estimated. The distribution of νi is approximated by 12 integration points in our models; the results are robust if we use eight or 16 integration points. In order to obtain an event-specific covariate effect, we interact each independent variable with the type of event; i.e., whether it is a first or a second birth. We estimated the recurrent event model using both the detailed 16-category educational pairing variable (specification 4) and the basic nine-category educational pairing variable (results available upon request). Findings for model specifications 1-4 are shown in table 2, and the coefficients and confidence intervals for these models are plotted in figures 1-4.

Results

Descriptives: Table 1 shows descriptive statistics for the distribution of couple years and events by couples' educational pairings and the other covariates. Both the nine-category and the finer grained 16-category pairings are shown. For easier readability, hypergamous couples (the man has more education) are marked in cursive, and hypogamous couples (the woman has more education) are marked in gray. Around 53% of the couple time is contributed by homogamous couples in which the partners have the same education level, which underscores that homogamy is the most common pairing, even though its prevalence decreased over time. Homogamous couples with secondary education are the most common pairing (29.95%), and they serve as the reference category in all models. We retain combinations of low and high tertiary education as homogamous (within the group of highly educated) couples in the finer grained panel. Hypogamous couples make up about 31% of couple time, while hypergamous couples make up only about 15% of couple time, reflecting changing gender ratios to the advantage of women in education. A closer look at the finer grained pairings reveals that in most tertiary educated homogamous couples both partners have lower tertiary education (9.3%), while a smaller percentage of these couples are 'elite couples' in which both partners have higher tertiary education (3.4%). Combinations of lower and higher tertiary education are present in less than 5% of couples (2.4% for each combination). Couples we have termed 'large distance', consisting of one partner with basic education and one with tertiary education, are rare, in particular among hypergamous couples. Only 0.04% of couple time is contributed by couples with a higher tertiary educated man and a basic educated woman, and only 0.32% of couple time is contributed by couples with a higher tertiary educated woman and a basic educated man. Combinations with lower tertiary and basic education are somewhat more common, at 0.8% among hypergamous couples and 3.3% among hypogamous couples.

Baseline Model: Model results are presented in figures 1-4 and in table 2. The figures graph the relative risk ratios of a second birth for the educational pairings. Figure 1 presents the baseline model with nine educational pairings. Compared with couples in which both partners are secondary educated, couples in which at least one partner is highly educated have higher second birth rates, while couples with low cumulative education resources (low/low or low/medium) have the lowest second birth rates. As expected, homogamous highly educated couples have the highest second birth rates. While the point estimate for hypergamous couples with a highly educated man and secondary educated woman is also lower than that for highly educated homogamous couples, the confidence intervals overlap. In general, there appears to be a positive cumulative effect of educational resources in couples on second birth hazards, which is nuanced by the observation that the man's tertiary education weighs somewhat more heavily than the woman's for predicting second birth progressions. These results confirm that previous findings on the relationship between partners' education and second births from other countries such as Germany and Norway also apply in the Finnish context (Dribe and Stanfors 2010, Nitsche et al. 2018, Kreyenfeld 2002, Kravdal 2007).

Finer Grained Educational Pairings: Next, we explore the potential drivers of these differential second birth rates. Figure 2 displays estimates based on the finer grained educational pairings; testing H1, H1a, and H1b. The estimates indicate that there are almost no differences in relative second birth risks among the four finer grained tertiary educated homogamous couple types (relative risk of 1.26-1.38 compared with the reference group). Couples with two low tertiary educated partners indeed have the lowest second birth risk in this set of couples, but the confidence intervals overlap. This finding leads us to reject the second part of H1b (*pooling*), which suggested that those four types would differ in their

second birth rates due to differences in their pooled socioeconomic resources. However, as expected, significant and, in some cases, large differences are detected among the finer grained hypogamous and hypergamous couples in which one partner is tertiary educated and the other is lower educated. Among the four types of hypogamous couples, those with the most educational capital – namely, couples in which the woman is high tertiary educated woman and the man is secondary educated (r.r. of 1.33), do not differ from homogamous highly educated couples. In contrast, the couples with the lowest cumulative capital (hypogamous couples with a low tertiary educated woman and a basic educated man) have second birth risks that are the lowest among the four types (0.98), and are significantly lower than those of both the homogamous highly educated couples and the other hypogamous couples. The other two hypogamous pairings' second birth risks lie in between those of the other two groups (r.r. of 1.26, 1.14). Indeed, it appears the differences in the second birth risks between the hypogamous and the homogamous highly educated couples mainly hinges on the two couple types that include a woman with low tertiary education, which supports the first part of the H1b *pooling* hypotheses. We see a similar differentiation between the four hypergamous pairings involving a highly educated man. The two pairings with a low tertiary educated man have smaller second birth risks than those with a high tertiary educated man. However, due to small cell sizes, the confidence intervals mostly overlap, despite the large differences in point estimates (ranging from 0.94-1.72). Nonetheless, the pairing of a low tertiary educated man and a woman with basic education has the lowest second birth risks among the four pairings, as their second birth risks are significantly lower than those of homogamous highly educated couples. This finding also supports H1b. As these findings show that the 'large distance' couples – namely, those with combinations in which one partner has high tertiary education and the other has basic education – do not have significantly lower

second birth risks than the homogamous highly educated couples, H1a must therefore be rejected. Moreover, given that only a very few couples with such a pairing exist, they likely represent a highly selective couple type.

Educational Upgrading: Figure 3 presents results from the model that includes the covariates for educational upgrading, testing H2. The overall patterns from model 2 remain unaltered, although some slight changes in relative birth risks are found. For instance, the second birth risks of the homogamous highly educated couples with a high tertiary educated man and a low tertiary educated woman increase slightly, while those of the couples with two low tertiary educated partners decrease slightly. This suggests that some couples use a strategy of waiting to have their second child until the man has upgraded his education from low to high tertiary. Indeed, the couples in which the man upgrades his education or neither partner upgrades their education have significantly higher second birth rates than the couples in which only the woman (r.r 0.78) or both partners (r.r. 0.81) upgrade their education, as shown in table 2. This finding runs contrary to our expectation that the woman upgrading her education would be associated with higher second birth rates. Hence, there is no indication of a widespread pattern of couples deciding to wait having a second baby until after the woman finalized her tertiary education. Indeed, if anything, the results suggest that the period after the man has upgraded his education is the preferred time to have a second birth. Nonetheless, the resulting changes in the educational pairing coefficients are small, and do not change the significance of the patterns we found in model two. Hence, while associations between educational upgrading and second birth risks are found, they do not seem to be driving differentials in second birth rates by educational pairing. This finding is confirmed in a model that adds education upgrading measures to the basic nine-category educational pairing specification, and suggests that the

differences shown in figure 1 remain (not shown but available upon request). Thus, we reject H2.

Unobserved Heterogeneity: Finally, figure 4 shows the results from the recurrent events models, including an unobserved heterogeneity term, and the control for education upgrading, for the finer grained educational pairing specification. Figure 4 reveals that the differences in second birth rates are only slightly affected by the inclusion of unobserved heterogeneity. First, among the homogamous highly educated couples, the pairing of a man with high tertiary education and a woman with low tertiary education has still the highest second birth risks (r.r. 1.38), even though the confidence intervals with the other highly educated couples overlap. Such couples may reflect a 'male earner-female caretaker' set-up with the highest levels of socioeconomic resources; for instance, pairings of a male doctor and a female nurse or a male scientist and a female teacher. Lower point estimates are found among the four types of hypogamous couples (ranging from 0.95 to 1.20) than among the set of the highly educated homogamous pairings, but the confidence intervals now overlap with the highly educated homogamous set for all but the lowest cumulative resources pairing of a woman with low tertiary education and a male partner with basic education. As in model 3, the confidence intervals for all hypergamous couples involving a tertiary educated man and a secondary or basic educated woman overlap with the highly educated homogamous set, even though the point estimate for the lowest resource pairing of a low tertiary educated man and a basic educated woman is much lower, at a relative risk of 0.92. Thus, we find partial support for H3; meaning that unobserved time-constant characteristics across pairings explain some of the birth differentials between highly educated homogamous pairings and hypogamous pairings with a highly educated woman and a secondary or basic educated man. Finally, it is

noteworthy that the differentials between the higher educated pairings and the lower and low/medium educated pairings are not affected by addressing unobserved heterogeneity. Here, the interactive effects of the partners' education appear to play a crucial role in second birth transitions. Couples in which both partners have basic education have a 40% lower rate of second birth (r.r. 0.60) than couples in which both partners have secondary education (our reference group), while the second birth rates of the two types of heterogamous couples in which one partner has basic education and the other has secondary education (r.r. 0.75; 0.79) are in between those of the low/low and medium/medium couple types. Thus, the cumulative human capital resources of both partners play an even larger role in the second birth transitions among the lower educated segment of the population in Finland.

Robustness Checks

We have estimated several additional models to check for the robustness of our educational pairing parameters. First, we estimated a series of stepwise models for all specifications in order to assess whether educational pairing differentials in second birth rates are exaggerated or diminished – in other words, mediated – by the control variables we use. An inflation of coefficients may, for example, result from artificially 'equalizing' couples on dimensions that may affect educational pairing formation, or that may be affected by educational pairings, such as the year of union formation, the age difference between the partners, or the couple's marital status. Second, we added controls for the age at first birth, while measuring the age at first birth in two different ways. First, it was measured as the woman's actual age at her first birth, and, second, it was measured as the woman's age at the first birth that occurred within the partnership. There is debate in the literature about whether the age at first (or previous)

birth should be controlled for in event-history models predicting the time to the second (or next) birth; and, if so, how it should be specified, in particular when attempting to obtain estimates for factors that themselves affect first birth timing, such as education (Hoem 1996, Kreyenfeld 2002, Kravdal 2007). Time squeezes among women who, on average, have their first child later in life, such as highly educated women, can lead to faster second birth progressions, thus producing higher second birth transition rates in time-to-event models. Time squeeze effects, if present, are pure timing effects, and are often further exacerbated by adding a control for age at first birth (Kreyenfeld 2002). For our main models, we have decided to forgo controlling for age at first birth, because it can be expected that such a control would exacerbate the differences in education effects on second birth timing. The literature has shown that when controlling for the partners' education, modeling interaction effects between the partners' education, and adding a common term for unobserved heterogeneity across birth episodes, may be more meaningful when assessing second birth risks by education than when controlling for age at first birth (Kreyefeld 2002, Kravdal 2007, Nitsche et al 2018). Nonetheless, we estimated additional models while controlling for age at first birth, which indeed showed exacerbated education pairing differentials. The findings for these and the stepwise models are shown in tables A and B in the appendix. As they detected the same patterns as our main models, our results are robust to these checks. While the coefficient sizes changed slightly, in particular after controlling for age at first birth, the relative distances between the educational pairings remained the same throughout.

Discussion and Conclusions

The relationship between fertility and education is complex; it is likely bi-directional, varies across time and place, and operates in part via its effects on union formation and stability (Morgan and Rindfuss 1996, Kravdal and Rindfuss 2008, Trimarchi and Van Bavel 2017, Nitsche and Brueckner forthcoming). Childbearing can occur over a rather long time span across the life course, and this is also the case for educational attainment and advancement processes. The relationship between education and second birth rates – including its directionality, strength, and underlying mechanisms; the differences therein between men and women; and the variation across time and place – has been the subject of considerable scientific debates, including debates about the measurements and modeling strategies used to assess this relationship (Kreyefeld 2002, Kravdal 2007, Wood and Neels 2016, Nisen et al.2018, Bremhorst et al. 2019, Zang 2019). Further complicating the fertility-education picture is a factor that has gained more attention in recent years; namely, that childbearing is inherently a two-person endeavor, which implies that individual education-fertility trajectories interact with the presence and the characteristics of the partner. Thus, the effort to jointly assess the partners' education-fertility nexus from a couple perspective has emerged as a crucial addition to individual-level studies in fertility research. Previous studies found that in some developed countries, couples in which both partners are tertiary educated are more likely to transition to a second birth than couples in which only one partner is highly educated, and, in particular, when the couples are hypogamous pairings consisting of a college educated woman and a lower educated man (Kreyenfeld 2002, Dribe and Stanfors 2006, Nitsche 2017, Nitsche et al 2018, Trimarchi and Van Bavel 2019). We have set out to further investigate the mechanisms that underlie this association, testing whether education classification schemes, education upgrading, and unobserved heterogeneity are behind these previous findings. Using Finnish register data – which include complete histories of individuals' education,

coresidential unions, and births – we add to the literature on couples' joint education and their fertility by providing further evidence of the relevance of education classifications and of unobserved couple-level heterogeneity across birth episodes. Four main findings have emerged.

First, from a descriptive perspective, the relationship between education and second birth transitions in Finland is, like in many other countries, contingent on whether each of the partners is high, medium, or low educated. The general pattern we observe is that the second birth rate increases steadily as the joint human capital of the couple increases.

Second, creating finer grained educational pairings by splitting the tertiary educated into two groups reveals that the heterogamous couples in which one partner is low tertiary educated and the other is secondary or basic educated partner are the ones who are driving the differentials between the broader high/high and high/lower pairings, particularly among the hypogamous couples. We are, therefore, able to confirm part of our first hypotheses; namely, that the pooling of resources, and the relatively low joint resources of heterogamous couples with a low tertiary educated partner, seem to be the underlying force driving the differentials between highly educated homogamous and heterogamous couples with one highly educated partner. Thus, we show that this finding in previous studies may be in part an artefact of the prevailing broad three-categorical education classification scheme. Nonetheless, we find that the joint resources of the two partners play an important role in the time to the second birth transition, as was first suggested by Oppenheimer (1997), and has been empirically shown in previous research (Dribe and Sanfors 2006, Kreyefeld 2002, Nitsche et al 2018). Future research should test in detail among both higher and lower educated groups of couples which of the resources

that are available to these couples through their joint education have the greatest effects on their birth progressions. These resources could range from economic resources, such as income, employment status, occupation, and employment security; to social resources, such as support from networks, family, schools, or the community at large; to health and psychological resources, such as stress and conflict management strategies or counseling resources, which may be more available to and accepted by people with (higher) tertiary education. In addition, learning more about the circumstances that are more or less conducive to couples' continued childbearing, while also investigating demographic change in couples' educational pairing distributions over time, may improve our understanding of the recent fertility declines that have been taking places across all ages and parities in Finland (Hellstrand, Nisen & Myrskylä 2020).

Distinguishing between individuals with high and low tertiary education has also revealed that those couples with a high tertiary educated man and a lower educated woman – regardless of whether the woman has low tertiary, secondary, or basic education – have the highest second birth rates in terms of point estimates. Because the number of such couples is small in the Finnish context, the confidence intervals are wider. Nonetheless, it appears that in Finland, these types of Beckerian couples in which the man is highly educated tend to have the highest second birth transition rates. Another interesting finding is that one partner having high tertiary education is generally consistently linked to the highest second birth rates, regardless of which of the two partners has high tertiary education. In other words, among those individuals with tertiary education, the partner's education affects the risk of a second birth transition primarily among those with low tertiary education. Why is high tertiary education linked to the highest likelihood or the fastest timing of progressing to a second birth, regardless of the education of the partner? Does attaining high tertiary education early in life

preselect individuals (who also form a union early) into higher fertility trajectories? Are those individuals selected on typically unmeasured characteristics in fertility research, such as goal orientation, life energy availability, a high achievement mentality, or above-average resilience levels and stress management capabilities (Kravdal 2007)? And could these baseline differences in skills be further refined by educational processes in college? While we control for stable characteristics among couples across birth episodes, our analyses do not address selection into union formation or educational pairings as such. As union formation has been shown to hinge upon educational attainment, it affects the transition to parenthood, particularly among men (Trimarchi and Van Bavel 2017, Nisen et al 2018). Nevertheless, as levels of education are continuing to rise, future research on the education-fertility nexus should seek to differentiate between (pathways into) low and high tertiary education in both individual- and couple-level studies.

Third, our results lead us to reject our hypotheses 1b and 2, which state that 'large educational distance' couples or educational upgrading are driving differentials in second births by educational pairing in Finland. While large distance couples are rare, it appears that potentially large ideational differences between the partners, as reflected in wide educational disparities between them, are not a systematic hindrance to progressing to a second birth.

Fourth, while unobserved stable characteristics among couples, which relate to first and second births transitions, explain some of the differentials among the higher educated homogamous and heterogamous pairings, they do so mainly by causing the confidence intervals to be larger, and less so by affecting the point estimates. This result at least partly confirms our hypothesis 3. The role of unobserved heterogeneity at the couple level across

birth episodes, as well as of unmeasured characteristics among individuals affecting the selection into unions and educational pairings, should be addressed in future research, potentially by using data from full registers to allow for more detailed assessments. Moreover, whether modeling frailty terms to control for unobserved heterogeneity is the most appropriate technique when modelling fertility histories has been debated (Trussell et al. 1992, Rodriguez 1994). We therefore advocate taking our results from the recurring event models as evidence that should be tested and confirmed by future research using alternative techniques, such as sibling-fixed effects, or the direct modeling of the omitted factors that are suspected to be behind the unobserved heterogeneity.

In sum, a variety of mechanisms that produce the second birth rate differentials observed among couples are at play simultaneously. Future research should investigate more deeply selection into education tracks, the meaning of obtaining high tertiary education for family formation, the specific couple-level dynamics that make the pooling of education resources relevant for couples' second birth progression rates, and whether these dynamics are the same among couples in the higher and the lower educated segments of the population.

Finally, it is well-known that in event-history models, timing and quantum are entangled. Hence, whether our findings represent pure timing effects or lead to quantum differentials remains an open question, to be addressed by future research. In an effort to overcome the timing-quantum problem, other scholars have attempted to use modeling alternatives, such as cure survival models (Bremenhorst et al. 2016 & 2019), or to measure retrospectively the fertility-education relationship and its timing and quantum implications at the end of the fertile life span (Kravdal 2007). While using such techniques when studying couples will bring

additional challenges related to union formation and separation timing, and to multiple unions formed over the life course, it could help us better understand the meaning of the significant connections between couples' joint educational resources and their childbearing behaviors.

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Online source 2 (statistics finland): http://pxnet2.stat.fi/PXWeb/pxweb/en/StatFin/StatFin__kou__vkour/statfin_vkour_pxt_001.px/?rxid=f7846e3b-8ea0-4db1-a310-31629df22be7

TABLES AND FIGURES

Figure 1: Baseline Model Second Birth (Model 0)**—9 Educational Pairings**

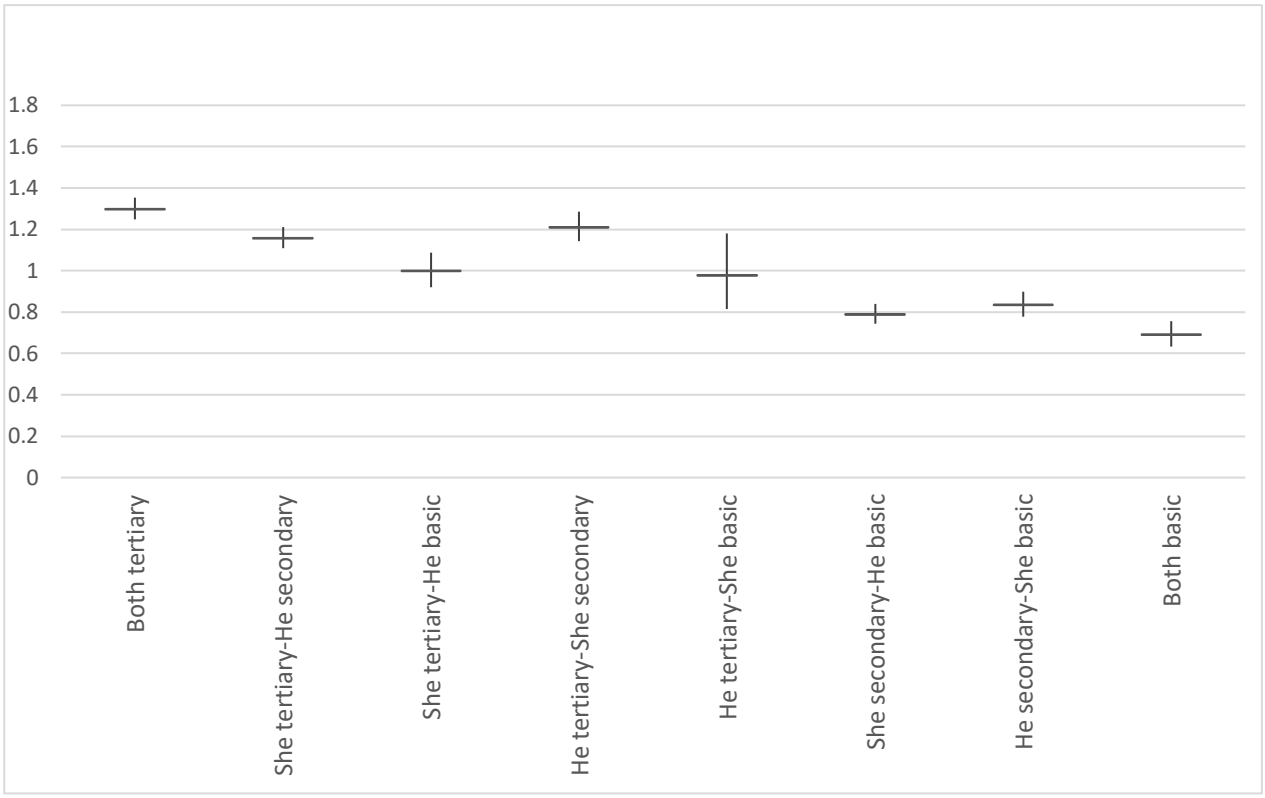

Figure 2: Low and High Tertiary Education Model Second Birth (Model 1)**—16 Educational Pairings**

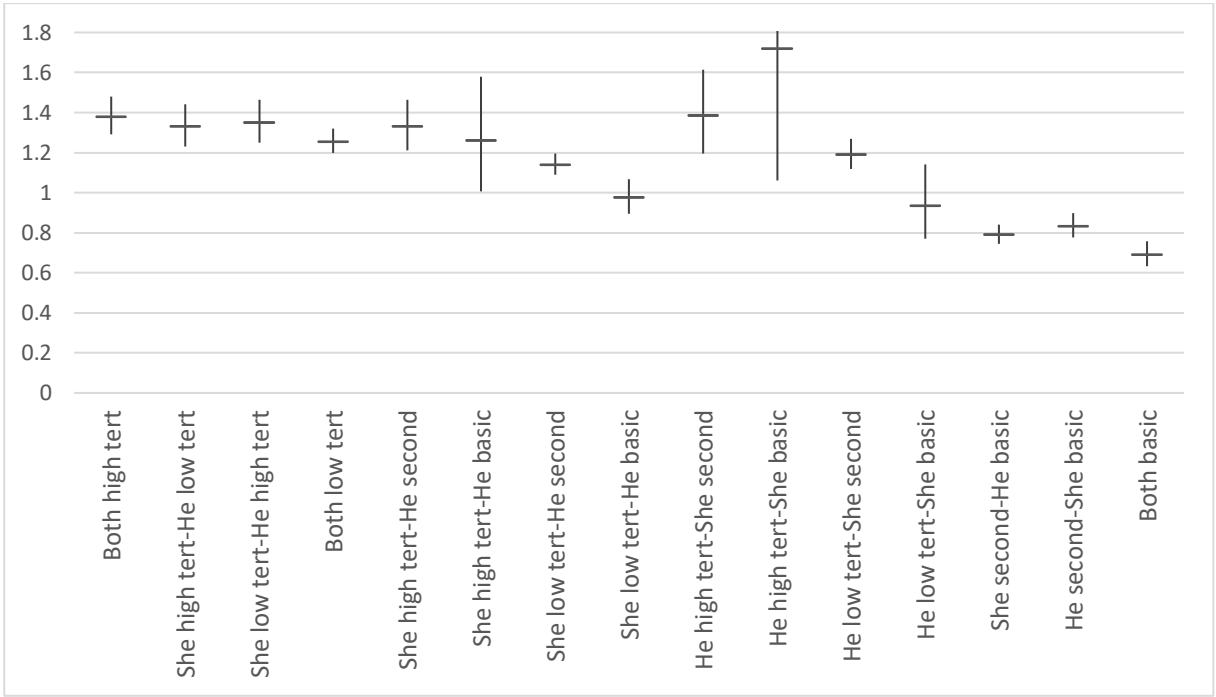

Figure 3: Upgrading Model Second Birth (Model 2)**—16 Educational Pairings + Upgrading**

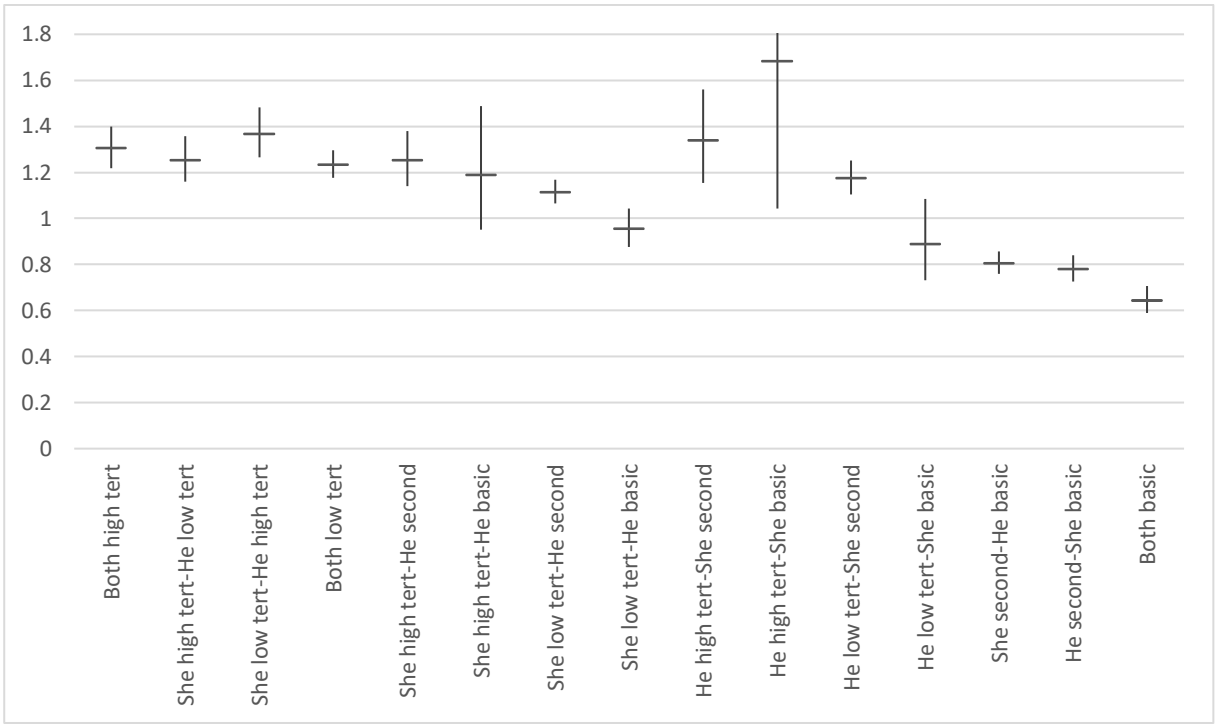

Figure 4: Unobserved Heterogeneity Second Birth (Model 3)**—16 Educational Pairings + Upgrading + Frailty**

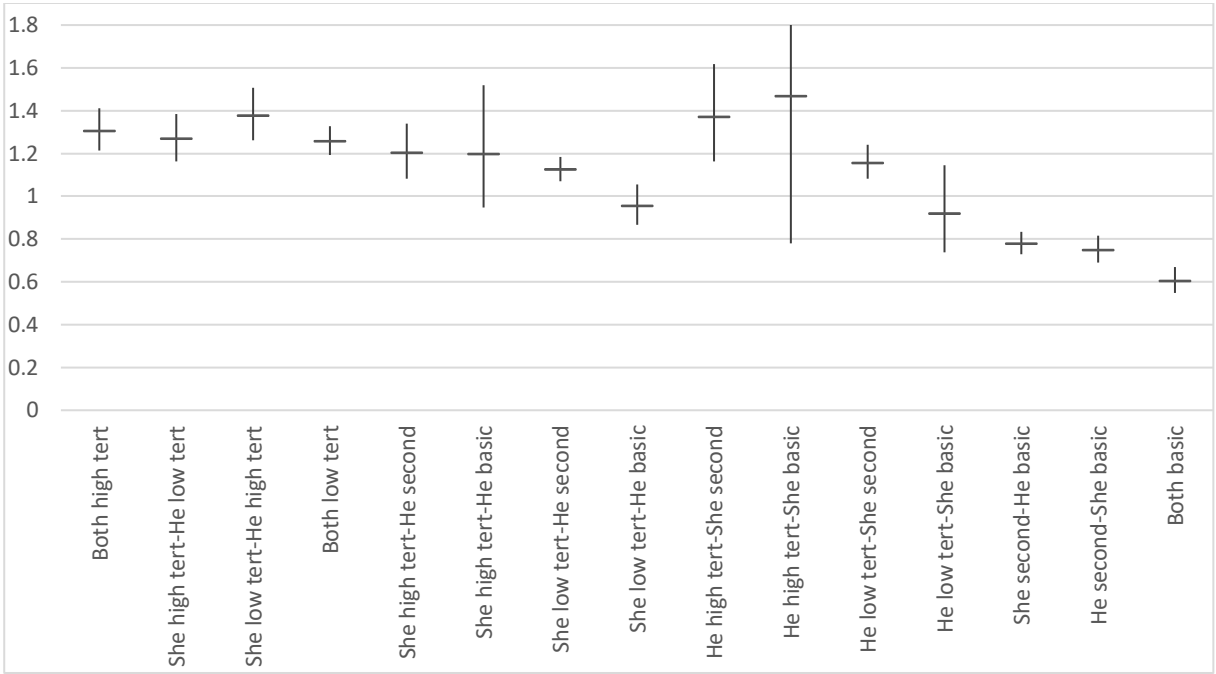

Table 1: Sample description, total number of events by couple time for each independent variable

Educational pairing 1	N Couple-Months	% Couple Months	N events
Both basic	83334	5.96	554
Both secondary	418993	29.95	4589
Both tertiary	244837	17.50	4288
She basic he secondary	*109431*	*7.82*	*893*
She basic he tertiary	*12040*	*0.86*	*122*
She secondary he tertiary	*89832*	*6.42*	*1287*
She secondary he basic	168837	12.07	1339
She tertiary he basic	50789	3.63	569
She tertiary he secondary	220967	15.79	3148
Educational pairing 2			
Both basic	83334	5.96	554
Both secondary	418993	29.95	4589
Both low tertiary	130715	9.34	2186
Both high tertiary	46815	3.35	872
She low tertiary he high tertiary	33172	2.37	616
She high tertiary he low tertiary	34135	2.44	614
She basic he secondary	*109431*	*7.82*	*893*
She basic he low tertiary	*11548*	*0.83*	*110*
She basic he high tertiary	*492*	*0.04*	*12*
She secondary he low tertiary	*79405*	*5.68*	*1119*
She secondary he high tertiary	*10427*	*0.75*	*168*
She secondary he basic	168837	12.07	1339
She low tertiary he basic	46266	3.31	501
She low tertiary he secondary	197496	14.12	2749
She high tertiary he basic	4523	0.32	68
She high tertiary he secondary	23471	1.68	399
Upgrading			
Both not	953822	68.18	11391
Only man	119746	8.56	1736
Only woman	259930	18.58	2755
Both up	65562	4.69	907
Type of union			
Unmarried cohabitation	229667	16.42	2936
Marriage	1169393	83.58	13853
Age difference between partners			
Age homogamy	539485	38.56	7188
Age hypergamy	*762037*	*54.47*	*8727*
Age hypogamy	97538	6.97	874
Unions' cohorts			
Before 1995	499511	35.70	5594
1995-2000	464044	33.17	6350
After 2000	435505	31.13	4845
Total	1399060		16789

Table 2: Model results, educational pairings, and second birth transitions

Variable	Model 1: Basic 9 Pairings		Model 2: 16 Pairings		Model 3: 16 Pairings + Up		Model 4: Heterogeneity	
Duration since First Birth (ref: 1)								
2-3	1.15	***	1.16	***	1.16	***	1.10	***
3-4	0.64	***	0.64	***	0.64	***	0.58	***
4-5	0.38	***	0.38	***	0.38	***	0.34	
5-6	0.22	***	0.22	***	0.22	***	0.20	***
6-7	0.14	***	0.14	***	0.14	***	0.13	***
7-10	0.06	***	0.06	***	0.06	***	0.05	***
10+	0.01	***	0.01	***	0.01	***	0.01	***
Union cohort (ref: <1995)								
1995-2000	0.88	*	0.87	**	0.85	***	0.83	***
> 2000	0.64	***	0.63	***	0.60	***	0.57	***
Partners' age-difference (ref: Same)								
Male older	0.95	***	0.95	***	0.95	***	0.94	***
Female older	0.90	***	0.91	***	0.91	***	0.87	***
Type of union (ref: Cohabitation)								
Marriage	1.07	***	1.07	***	1.05	**	0.99	
Educational pairing 1 (ref: Both Sec.)								
Both basic	0.69	***						
Both tertiary	1.30	***						
She basic he secondary	0.84	***						
She basic he tertiary	0.98							
She secondary he tertiary	1.21	***						
She secondary he basic	0.79	***						
She tertiary he basic	1.00							

She tertiary he secondary	1.16	***						
Educational pairing 2 (ref: Both Sec.)								
Both basic			0.69	***	0.64	***	0.60	***
Both low_tertiary			1.26	***	1.23	***	1.26	***
Both high_tertiary			1.38	***	1.31	***	1.31	***
She basic he secondary			0.84	***	0.78	***	0.75	***
She basic he low tertiary			0.94		0.89		0.92	
She basic he high tertiary			1.72	*	1.68	*	1.47	
She secondary he basic			0.79	***	0.81	***	0.79	***
She secondary he low tertiary			1.19	***	1.18	***	1.16	***
She secondary he high tertiary			1.39	***	1.34	***	1.37	***
She low_tertiary he basic			0.98		0.96		0.96	
She low_tertiary he secondary			1.14	***	1.12	***	1.13	***
She low_tertiary he high tertiary			1.35	***	1.37	***	1.38	***
She high_tertiary he basic			1.26		1.19		1.20	
She high_tertiary he secondary			1.33	***	1.25	***	1.20	***
She high_tertiary he low tertiary			1.33	***	1.25	***	1.27	***
Educational Upgrading (ref: None)								
Only man					1.00		1.03	
Only woman					0.78	***	0.75	***
Both Up					0.81	***	0.80	***
Constant	0.02	***	0.02	***	0.02	***	0.02	***
Log-likelihood	-35551.842		-35539.347		-35461.635		-226267.67	
N	29773		29773		29773		70331	

All models include woman's year of birth fixed effects, coefficients not shown.
*** p <= 0.001, ** p <= 0.01, * p <= 0.05, ◊ p <= 0.1

APPENDIX

Table A: Stepwise models, basic educational pairing (no education upgrading control)

	Model 0	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**
Educational pairing						
Both basic	*0.70****	*0.69****	*0.69****	*0.70****	*0.68****	*0.61****
Both secondary	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*
Both tertiary	*1.26****	*1.32****	*1.31****	*1.31****	*1.50****	*1.48****
She basic he secondary	*0.84****	*0.83****	*0.84****	*0.84****	*0.83****	*0.75****
She basic he tertiary	*0.96*	*0.98*	*0.98*	*0.99*	*0.95*	*0.89*
She secondary he tertiary	*1.20****	*1.22****	*1.22****	*1.21****	*1.28****	*1.27****
She secondary he basic	*0.79****	*0.79****	*0.80****	*0.80****	*0.79****	*0.79****
She tertiary he basic	*0.95*	*1.01*	*1.01*	*1.00*	*1.11***	*1.07*
She tertiary he secondary	*1.13****	*1.17****	*1.17****	*1.16****	*1.27****	*1.24****
Model controls for:						
Woman's birth cohort	***yes***	***yes***	***yes***	***yes***	***yes***	***yes***
Union cohort	*no*	***yes***	***yes***	***yes***	***yes***	***yes***
Age difference partners	*no*	*no*	***yes***	***yes***	***yes***	***yes***
Marital status	*no*	*no*	*no*	***yes***	***yes***	***yes***
Age first birth (woman)	*no*	*no*	*no*	***yes***	*no*	*no*
Age first birth (within couple)	*no*	*no*	*no*	*no*	***yes***	***yes***
Education upgrading	*no*	*no*	*no*	*no*	*no*	***yes***
Constant	*0.18*	*0.19*	*0.19*	*0.19*	*0.17*	*0.20*
Log-likelihood	-35771.61	-35565.95	-35557.99	-35506.63	-34643.08	-34486.84

Table B: Stepwise models, finer grained educational pairing (no education upgrading control)

	Model 0	Model 1	Model 2	Model 3	Model 4	Model 5
Educational pairing						
Both basic	*.70****	*0.69****	*0.69****	*0.70****	*0.68****	*0.61****
Both secondary	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*	*ref.*
Both low tertiary	*1.24****	*1.27****	*1.27****	*1.26****	*1.40****	*1.38****
Both high_tertiary	*1.31****	*1.42****	*1.40****	*1.44****	*1.78****	*1.67****
She basic he secondary	*0.84****	*0.83****	*0.83****	*0.84****	*0.82****	*0.75****
She basic he low tertiary	*0.92*	*0.93*	*0.94*	*0.94*	*0.91*	*0.85*
She basic he high tertiary	*1.60◊*	*1.73**	*1.73**	*1.75**	*1.84**	*1.74**
She secondary he basic	*0.79****	*0.79****	*0.79****	*0.79****	*0.79****	*0.80****
She secondary he low tertiary	*1.18****	*1.20****	*1.19****	*1.19****	*1.26****	*1.24****
She secondary he high tertiary	*1.34****	*1.41****	*1.40****	*1.40****	*1.53****	*1.48****
She low tertiary he basic	*0.94*	*0.98*	*0.98*	*0.98*	*1.07*	*1.04*
She low tertiary he secondary	*1.11****	*1.15****	*1.15****	*1.14****	*1.24****	*1.22****
She low tertiary he high tertiary	*1.30****	*1.38****	*1.37****	*1.37****	*1.59****	*1.63****
She high tertiary he basic	*1.11*	*1.28**	*1.28**	*1.30**	*1.53****	*1.42***
She high tertiary he secondary	*1.25****	*1.36****	*1.36****	*1.38****	*1.66****	*1.55****
She high tertiary he low tertiary	*1.26****	*1.35****	*1.35****	*1.38****	*1.65****	*1.55****
Model controls for:						
Woman's birth cohort	***yes***	***yes***	***yes***	***yes***	***yes***	***yes***
Union cohort	*no*	***yes***	***yes***	***yes***	***yes***	***yes***

Age difference partners	*no*	*no*	***yes***	***yes***	***yes***	***yes***
Marital status	*no*	*no*	*no*	***yes***	***yes***	***yes***
Age first birth (woman)	*no*	*no*	*no*	***yes***	*no*	*no*
Age first birth (within couple)	*no*	*no*	*no*	*no*	***yes***	***yes***
Education upgrading	*no*	*no*	*no*	*no*	*no*	***yes***
Constant	*0.18*	*0.19*	*0.19*	*0.19*	*0.17*	*0.20*
Log-likelihood	-35764.69	-35551.49	-35544.21	-35488.55	-34601.08	-34457.19

*** p <= 0.001, ** p <= 0.01, * p <= 0.05, ◊ p <= 0.1