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ORIGINAL RESEARCH

The Role of Gender Differences in Partnering and Re-partnering for Gender Differences in Completed Fertility

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Abstract

Individuals increasingly enter a series of relationships during their reproductive years. As births in higher-order unions increase, fertility becomes partially contingent on re-partnering. Previous research suggests that men re-partner at higher rates than women. This study analyzes whether gender differences in partnering and re-partnering influence gender differences in cohort fertility. We use Finnish register data on all births, marriages, and cohabitations between the ages of 18 and 47 over four full birth cohorts. The gender differences in cohort fertility rate are decomposed into components due to birth rate differences and a compositional component owing to gender differences in the share partnered and re-partnered. We observe no impact of "re-partnering premium" on male fertility. Men have marginally higher re-partnering rates at older ages, when birth rates are low, whereas women have higher rates of partnering and re-partnering at prime childbearing ages. This compositional effect drives a "partnering" advantage for female fertility. This connection between gender differences in partnering and cohort fertility is true across educational levels.

Keywords Life course · Finland, register data · Cohort fertility · Union dissolution · Divorce · Gender differences · Re-partnering · Serial monogamy · Partnering

Introduction

Fertility rates of men and women vary across contexts (Schoumaker, 2019). Women demonstrate slightly higher fertility than men in high-income countries post WWII, whereas men sometimes have substantially higher fertility in medium and low income countries (Dudel & Klüsemer, 2018; Dudel & Klüsener, 2016). Explanations for gender disparities in fertility often emphasize the role of partnership dynamics.

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Men, for example, are more likely to never-partner, whereas women partner earlier, resulting in different exposure to reproductive partners (e.g., Jalovaara & Fasang, 2017). We argue in this study that if gendered partner dynamics are indeed relevant, then the increase in re-partnering may have altered the dynamics of gender differences in fertility. Owing to increased union instability, more individuals today dissolve their first union before reaching childbearing ages. As a result, a wide-spread practice of re-partnering has emerged, which may also contribute to postponement of childbearing to later ages (Hiekel & Fulda, 2018; Thomson, 2021). Therefore, the number of childbirths in re-partnered, higher-order unions, and at older ages may increase significantly (Guzzo, 2014, Griffith & Koo, 1985). Accordingly, potential factors influencing the proclivity to re-partner can be decisive for completed fertility. Previous studies have discovered significant gender differences in re-partnering and post-union dissolution childbearing in general, with men having a higher rate of re-partnering in particular (Beaujouan & Ní Bhrolcháin, 2011; É. Beaujouan & Wiles-Portier, 2011; Berger et al., 2018; Buyukkececi, 2021; de Graaf & Kalmijn, 2003; Ivanova et al., 2013, 2014; Kalmijn & Gelissen, 2007; Livingstone, 2014; Maslauskaité & Baublyté, 2015; Payne, 2018; Poortman, 2007; Vanassche et al., 2015; Vikat, Thomson & Hoem, 2004; Wu, 2017; Wu & Schimmele, 2005). This raises the question of how a male "re-partnering advantage" is related to the overall gender differences in completed fertility.

This study examines gender differences in fertility when union instability and re-partnering are common. The majority of research into this topic focuses on gender differences in either re-partnering or post-dissolution births (e.g., É. Beaujouan & Ní Bhrolcháin, 2011; I Ivanova et al., 2014; but see Vanassche et al., 2015 for important exceptions). Differences in sample conditioning and denominators, definition of unions (marriage or cohabitations), right censoring, and age-span make it difficult to synthesize previous findings. Despite the importance of post-union dissolution partnering and childbearing for contemporary family demography (Raley & Sweeney, 2020), and the theoretical interest in gender differences therein (e.g., Goldscheider et al., 2015), there has been no focused and comprehensive attempt to quantify the contribution of gender differences in re-partnering to that in the overall cohort fertility. This research gap limits our understanding of core fertility processes in the increasingly common context of "serial monogamy": re-partnered unions are now a common childbirth context in many countries. Furthermore, understanding gender differences in re-partnering and childbearing is critical because post-dissolution partnership and parental status are key determinants of financial and social well-being (Andersson, 2021; McLanahan & Percheski, 2008; Nieuwenhuis & Maldonado, 2018).

This study addresses this research gap using data from the Finnish registry of births, marriages, and cohabitations from ages 18 to 47 of four birth cohorts. We examine the significance of gender differences in partnering, union dissolution, and re-partnering matter for gender differences in cohort fertility by age 47 using a completed cohort approach. We begin by calculating the proportion of men and women in unions, first unions, separations from first unions, and subsequent partnerships. The sum of the age-specific births in first unions and in higher-order unions is then used to estimate the fertility of the male and female cohorts. Finally, we decompose

the gender differences in total fertility owing to gender differences in the fraction partnered and re-partnered, and due to gender differences in birth rates in first and higher-order unions. This approach connects the frequently disparate literature on gender differences in partnering and gender differences in fertility through empirical investigation of how and whether gendered (re-) partnering dynamics are related to gender differences in completed fertility. The method also sheds light on the prevalence of gender disparities in first and higher-order unions over the course of a person's life, which is helpful as age is likely to moderate the impact that partnering and re-partnering have on birth rates. This study also complements several previous studies that have focused on individual-level outcomes, such as second union birth risks, rather than the population-level question of how lifetime gendered partnering patterns affect gender differences in completed fertility rates. By offering a population-wide account of gender differences in re-partnering, which covers all unions (marriages and non-marital cohabitations throughout an individual's life), this study elucidates and extends previous studies' estimates on gender differences in re-partnering. Previous studies indicate that socioeconomic status influence the gendered processes of post-union dissolution re-partnering and fertility (Dewilde & Uunk, 2008). Therefore, we differentiate between people with and without tertiary education.

Literature Review

In Finland and the rest of the Nordics, female CFR is between 0.1 and 0.2 higher than male CFR (Jalovaara et al., 2019). A similar pattern is present in several European countries, whereas, in France, Portugal, and English-speaking countries, men and women have the same level of lifetime childbearing (Dudel & Klüsener, 2021). Shoumaker (2019) shows that male fertility is higher in two-thirds of 160 studied countries, and this pattern primarily correlates with high fertility. Broadly, extant evidence suggests that economic development or demographic transition is associated with higher fertility among women than men. Yet, variation between developed countries remains unexplained, and explanations that target specific behavioral differences between men and women are largely unexplored. The current study takes note that union formation, separation, and re-partnering, are found to be both a determinant of fertility (Andersson et al., 2022) and have a gendered pattern (Beaujouan & Ní Bhrolcháin, 2011).

For much of history, the person with whom one first formed a household was also one's reproductive partner; research on widowhood and re-marriage suggests that higher-order partnership generated only a small proportion of total births in the population (Coontz, 2006; Laslett, 1980). Today, this association between first partnership and childbearing has been partially disrupted (Dommermoth & Wiik, 2014, Gray, 2015; Thomson, 2021). Instead, it is rather common to enter multiple consecutive consensual relationships, cohabitations, or marriages; a behavior referred to as serial monogamy (Guzzo & Hayford, 2020). As a first-time union form in early adulthood, cohabitations have largely superseded marriage (Billari & Liefbroer, 2010; Elzinga & Liefbroer, 2097), and many of these first cohabitations end just a

few years after union formation (Sobotka & Toulemon, 2008). In the United States and large parts of Europe, for example, the proportion of people who had a union dissolution, whether from marriage or a cohabiting union, within 16 years of the first, ranges from 16% in Spain to 61% in the United States (Andersson et al., 2017, Table A-26). Much of union instability occurs during childbearing years, and many people who have dissolved their first marital union have not yet become parents or have had at most one child. Therefore, births after union dissolution have the potential to account for a considerable portion of total population fertility. In Finland, the context of the current study, Andersson and colleagues (2022) show that births in higher-order unions can account for up to a quarter of cohort fertility. Several studies have found that men are more likely to re-partner and women have lower fertility rates as they get older, when higher-order unions are the most common (e.g., Beaujouan, 2012, Graaf & Kalmijn, 2003; Maslauskaité & Baublyté, 2015; Payne, 2018; Z. Wu & Schimmele, 2005). These findings lead to the question: is it possible that societies characterized by serial monogamy alter the conditions to favor male fertility?

Partnering, Divorce and Re-partnering

In the majority of high-income countries for which we have data, men are somewhat more likely to be non-partnered (Andersson et al., 2017; Jalovaara & Andersson, 2022; Sandström & Karlsson, 2019), as well as to have never partnered (Bellani et al., 2017; Jalovaara & Fasang, 2017). Estimates of re-partnering for men and women across countries can be difficult to assess as many relationship biographies focus on women or only partially enumerate non-marital unions. However, several estimates of remarriage and re-partnering suggest that men are more likely to enter higher-order unions than women. Men in the United States are consistently found to be more likely to remarry (Livingstone, 2014; Lewis & Kreider, 2015, Payne, 2018; Shafer & James, 2013; Z. Wu & Schimmele, 2005). According to estimates based on both marital and co-residential unions in the United Kingdom, approximately two-thirds of women and three-fourths of men found a new partner (É. Beaujouan & Ní Bhrolcháin, 2011). Many European countries have reported similar patterns where men either re-partner faster or are more likely to have re-partnered during the study period (de Graaf & Kalmijn, 2003; Maslauskaité & Baublyté, 2015; Poortman, 2007).

One proposed explanation for this "male re-partnering advantage" is that the remarriage market is male-biased: gender differences in partner preferences and norms allow men to find partners more easily as they get older (Gelissen, 2004; Goldscheider & Sassler, 2006; Lampard & Peggs, 1999). According to some anthropological research, men are more likely to find partners in older ages as they are less discriminatory in partner selection and more positively inclined toward promiscuous behavior, increasing proclivity and preparedness to transit between unions (Borgerhoff Mulder, 2020). Others contend that the burden and adversity caused by union dissolution is often greater for women than for men (Boertien & Lersch, 2021; McDonald, 2020; Poortman, 2007). According to Poortman (2007), prior

union dissolution reduces the age-related risks of (re-)partnering to a greater extent for women in the Netherlands, and union dissolution is typically more consequential for women in terms of subsequent partner behavior. Ivanova et al. (2013) found that, across five European countries, higher male re-partnering and attributed this to parental status and gender differences post-separation households: women and men with children in the household are less likely to re-partner than women and men without children in the household. The authors suggest that, as separated women are more likely to have resident children, this child effect drives the observed male re-partnering advantage, a conclusion supported by Di Nallo (2018) for the US.

Births in First and Higher-Order Unions

Gender differences in fertility is influenced by gender disparities in age- and union-specific birth rates in addition to differences in partnering incidence. According to Dudel & Klüsemer (2018), the synthetic cohort total fertility rates (TFR) for women in low-fertility countries tend to be 0–0.3 greater than those for men. However, comparative research also reveals considerable variations in TFR gender disparities (Schoumaker, 2019). Another aspect of gender differences in fertility is that male fertility declines slightly less with age than female fertility (Beaujouan & Solaz, 2013). Births are shifting toward higher-order unions and later ages, a period in the life course where male birth rates are typically higher, as parenthood is postponed to older ages and union instability in young ages increases (Beaujouan & Berghammer, 2019). This means that period fertility measures are less indicative of completed fertility.

Finally, although empirical evidence is limited, there are theoretical grounds for predicting a male "fertility-premium" in higher-order unions. Women are more likely than men to retain primary custody of children after a union dissolves, and the responsibilities that follow may impede women's transitions to higher parities (in re-partnered unions) more than men. This contention, however, is not supported by empirical evidence. Some studies found no gender differences in birth risk (Ivanova et al., 2014; Vanassche et al., 2015) or childbearing intentions (Stewart, 2002) among people seeking to become parents in higher-order unions, whereas Kalmijn and Gelissen (2007) discovered that children from previous unions impede childbearing in subsequent unions more for women than for men. Individuals who are at risk of post-dissolution births (births after the dissolution of a first union) are older than those who are at risk of pre-dissolution births. Men's fertility is less affected by age than women's; therefore, age-related infertility has a weak effect on men's post-dissolution births (Beaujouan & Solaz, 2013). Men partner with women who are one average of two years younger than them (e.g., Dudel, Cheng & Klüsener 2020; Kolk 2017), and this discrepancy may be even stronger in higher-order unions. Yet, the effect of men's childbearing at older ages remains mitigated by such levels of age correlations (a woman of 45 and a man of 50 will have problems conceiving even if the age correlation is relatively high) and cultural norms of parenthood at older ages (Beaujouan & Solaz, 2013). Furthermore, absolute birth rates at older ages are substantially lower than those at younger ages.

Research Gap

To summarize, previous studies provide ample theoretical and empirical support for the hypothesis that re-partnering and higher-order union births can typically have a significant impact on fertility, and in particular, may be important for gender differences in completed fertility. However, there are at least two issues with drawing conclusions from previous studies on how gender differences in partnering influence gender differences in completed fertility. First, these studies focus on either gender differences in (re)-partnering (e.g., Di Nallo, 2019; Skew et al., 2009) or in post-dissolution fertility (e.g., Buber & Prskawetz, 2000; Jefferies, 2000), rather than the interrelationship between the two. Second, the re-partnered population is often considered in isolation. A sizable literature study union order-specific birth hazards but do not analyze how births across unions aggregate to total fertility rates (Meggiolaro & Ongaro, 2010; Thomson et al., 2012; Vikat et al., 1999). Despite drawing on explanatory frameworks that emphasize gender, most studies focus solely on either men or women (e.g., Schnor, C., Vanassche, S., and Van Bavel, J. (2017). Moreover, when analyzing partnering and re-partnering specific birth rates, it is critical to cover an individual's entire reproductive span as using synthetic cohorts can inflate fertility estimates (Hoem & Mureşan, 2011). Furthermore, it is prudent to not condition the population based on union events while studying completed fertility. For instance, men are more likely than women to never partner, making them less likely to be a part of the divorced population. Therefore, using the divorced population as the denominator does not provide a complete picture of the influence of gender differences in partnering on that of completed fertility. Therefore, the purpose of this study is to examine how gender differences in fertility influence gender differences in union dissolution and re-partnering from a completed cohort perspective.

Repartnering and Fertility in Context

Gender differences in partnering and their impact on fertility are likely to be influenced by country variation in institutional factors as well as demographic patterns. Below, we discuss the Finnish context in contrast to other countries. First, the interplay between gender and educational level may be less important in countries with individual economic autonomy through high female participation in the labor market and dual-earner models. Finland, in this study's context, has a comprehensive welfare system, and women are well-integrated into the labor market. Similarly, substantial social benefits would reduce the overall importance of socioeconomic status (See Andreß et al., 2006). Therefore, our findings regarding heterogeneity across gender and educational level may be regarded as lower-bound estimates (Bellani et al., 2017).

Second, the influence of re-partnered childbearing on fertility may depend on demographic factors such as the share of fertility accounted for by higher-order parities, because births in higher-order unions occur disproportionally at higher parities. The most recent periods as seen a sharp decline in births across parities in Finland, a trend present in many western countries (Hellstrand et al. 2020). Yet, the completed

fertility of recent cohorts, including those in the current study, is close to reproduction levels and comprises a substantial degree of higher parity births compared to many other countries (Zeman et al 2018). Hence, the potential magnitude of re-partnering on gender gaps in fertility may be greater in Finland (and other countries with substantive births at second or higher parities) in contrast to countries where fertility is mainly the result of births at first parity.

Likewise, the influence of re-partnered childbearing on fertility may depend on rates of cohabitation, separation, and divorce because this behavior dictates the denominator, e.g., how many people are at risk of re-partnering or childbearing in a re-partnered union. From a comparative perspective, Finland has a high rate of cohabitation and of separation, as well as high rates of divorce in marital unions (Andersson et al., 2017; Jalovaara & Andersson, 2022). This could imply that if substantive gender differences do exists in re-partnering and in childbearing in re-partnering unions in Finland, then these disparities have a greater influence on gender differences in cohort fertility due to the large size of the separated and re-partnered population compared to countries in which this group is smaller.

Socioeconomic Status and Educational Gradients

According to certain marriage market theories, partnering (and re-partnering) outcomes vary at the intersection of gender and educational level as preferences for potential partners' human capital or socioeconomic status (SES) are gendered (Jalovaara et al, 2019). On average, the propensity among men to prefer high SES (female) partners appears to be weaker than the propensity among women to prefer high SES (male) partners (Walter et al., 2020). The empirical evidence for re-partnering is contrasting. Shafer and James (2013) demonstrate a positive socioeconomic gradient in re-marriage for men but not for women in the United States. Maslauskaité and Baublyté (2015) find no educational gradient in re-partnering for women but a positive educational gradient for men in four European countries, whereas Hiekel and Fulda (2018) find no educational gradient in serial cohabitation. Other studies view re-partnering as a strategy for mitigating the economic distress caused by union dissolution (See Andreß et al., 2006). Low income is expected to have a positive impact on re-partnering, especially for the sex that loses the most economic autonomy as a result of union dissolution, and is more likely to become secondary providers to the household economy (Dewilde & Uunk, 2008).

The above predictions regarding gender and SES in re-partnering are frequently applied to childbearing in higher-order unions. Births in higher-order unions are mostly prevalent among vulnerable populations, as with several other family demographic behaviors that deviate from the normatively prescribed ideal form (McLanahan & Percheski, 2008), partly as a result of turbulent life courses that compromise family planning or the realization of such family planning (Guzzo, 2017). Conversely, the income argument predicts that SES increases higher-order union births for men but not necessarily for women (Lappegård, 2020; Lappegård & Rønsen, 2013). The secondary purpose of this study is to address this research gap by analyzing the tertiary and non-tertiary educated population.

Methods

Data

We use demographic data from Finnish registers on births, deaths, migration, co-residential unions, and marriages. Our population includes all birth cohorts from 1969 to 1973 who were registered in the country from the age of 18 to 47 (134,620 women and 140,022 men), and were censored at death or migration.

Statistics Finland includes records of co-residential unions and maintains data on individual residential location beginning in 1987. A person is considered to be in a union if they share a residence for more than 90 days with a person of the opposite sex who is not a relative, and is within an age difference of 20 years (the latter rule does not apply if the dyad is married or has a common child). We combine this measure with data from civic records to estimate union dyads. Previous research has validated this method (Jalovaara & Kulu, 2018), which parallels the POSSLQ (people of the same sex sharing living quarters) approach (Kennedy & Fitch, 2012). Union dissolutions are calculated by combining civic data on divorces with residential separation and death registers. Bereavement account for less than 1.2% of union dissolutions in our study population.

To analyze male fertility, birth records are more reliable than self-reported births. If married, paternity is automatically granted to the male spouse, whereas unmarried couples must obtain formal consent for paternity, with a social services investigation pending if paternity is unrequited or unknown at the time of delivery. Approximately 2% of the children have no paternal information in their registers. Our age range to measure gender differences is 18–47. Births at later ages would mostly occur in the male population. An examination of an older male cohort fertility in Finland (1963 birth cohort) reveals that approximately 3% of births occur between the ages of 46 and 55 (Andersson et al, 2022). This indicates that our cut-off slightly underestimates male fertility, but likely marginally so (Nisén et al., 2014).

Variables

We measure fertility using birth events on a yearly basis. We develop a yearly categorical variable for union status, with three values: not in a union, in a first union, and in any higher-order union. The union status included both marital status and non-marital cohabitation. Birth and union states are categorized into three-year age groups. We do not distinguish between the birth propensities of marital and non-marital unions because the primary focus of this study is gender differences in the more rudimentary dichotomy of having a union versus not having one, a dichotomy that is significantly more predictive of childbirth.

Furthermore, we obtain the highest level of education attained by an individual by age 47 years and categorized the data in terms of Finnish educational nomenclature into one group with and one group without tertiary education, which are equivalent to the 2012 ISCED schema 1–4 and above 5, respectively (UNESCO, 2012). We

use educational level as a stratifying variable as it has been found to be important for union formation, stability, and fertility (e.g., Wood Neels & Kil, 2014). Moreover, educational levels, unlike variables such as income, exhibit less yearly variation and less reverse causality with childbearing. Appendix Tables 2 and 3 present the frequency and proportion of person-years and births by gender, union status, and educational level.

Analysis Method

We examine how gender differences in union instability, re-partnering, and fertility influence gender differences in completed fertility in three steps. Although gender differences in birth rates are contingent on gender disparities in partnering rates, it is noteworthy that the influence of partnering rates on fertility varies across an individual's life course: higher union prevalence at age 47 is less important than that in prime childbearing ages. We first compare four measures of age-specific union rates, namely total union prevalence, first union prevalence, re-partnered union prevalence in the total population, and re-partnered union prevalence in the divorced population, to show gender differences in partnering across the life course. Second, we measure CFR using the following equation adjusted for age_a and union status_i separately for men and women.

$$CFR = \sum_{ai} \left(ASFR = \frac{Births_{ai}}{person - years_{ai}} \right) \tag{1}$$

More specifically, we calculate the proportion of men's and women's CFR that can be attributed to births at a given age and in a given union context, namely outside of union, in the first union, or in any subsequent partnerships (second or higher). We do so by calculating age-specific birth rates (ASFR) for each of the three union states (f_{nx}) and multiplying this by the share of women at each age and state (p_{nx}), and then taking the overall product (Eq. 2). This approach is consistent with that of Barclay and Kolk (2020) and Thomson et al (2020).

$$CFR = \sum_{n=1}^{k} f_{nx}\, p_{nx} \tag{2}$$

Finally, we examine how men's and women's age-specific partnering and birth rates contribute to the overall gender disparity in CFR. We use a standard demographic decomposition method (Das Gupta, 1993; Kitagawa, 1955) to categorize gender differences in CFR into two parts: one attributed to gender differences in birth rates and the other to gender differences in the proportion of person-years spent in a union after the first union dissolution (Eq. 2). The difference in the total fertility rate (ΔCFR) is equal to the sum of the proportion of women and men in age group_a and union-status_i (w_{ai}) multiplied by the average age and union-status-specific fertility rate among men and women $\left(\frac{ASFR_{aimen} + ASFR_{aiwomen}}{2} \right)$, plus the difference in age_a and union-status_i-specific fertility $\Delta ASPFR_{ai}$ multiplied by the average of the proportion

of men and women in age$_a$ and union-status$_i$ $\frac{w_{aimen}+w_{aiwomen}}{2}$. A positive gender difference delta (Δ) indicates a higher *CFR* for men in this study, whereas a negative delta indicates a higher *CFR* for women. Consider the following scenario: we observe higher fertility in males than females ($\Delta CFR > 0$) and higher re-partnering rates in men at some point during the life course. Equation 3 shows whether and to what extent higher partnership and re-partnership rates among men influence this male fertility advantage.

$$\Delta CFR = \sum_{ai} \left[\left(\frac{ASFR_{aimen} + ASFR_{aiwomen}}{2} \right) + \left(\Delta ASFR_{ai} \frac{w_{aimen} + w_{aiwomen}}{2} \right) \right] \tag{3}$$

The primary goal of this analysis is to gain a better understanding of how the overall difference in re-partnering between men and women impacts gender differences in fertility. However, as demonstrated by previous research, gendered behavior in partnering and fertility is sometimes stratified. Therefore, as secondary analyses, we repeat Eqs. 1–3 separately for individuals with and without tertiary education. Estimates could be hampered by small numerators at the tails in a more disaggregated operationalization. The distinction between tertiary and non-tertiary education is frequently found to influence union formation, stability, and fertility (e.g., Wood Neels & Kil, 2014), allowing us to investigate signs of sources of heterogeneity with confidence in the outcome.

Results

Partnering and Re-partnering

Figure 1A depicts that women in Finland are more likely to be in a union (first or a subsequent union) than men. This pattern prevails in all ages, but gender differences in unions are the greatest between the ages of 21 and 29, spanning eight to eighteen percentage points. The gap shrinks substantially to five percentage points by age 33–35 and diminishes further by age 47. Figure 1B solely presents first unions. Again, women are significantly more likely than men to be in a first union at younger ages, reflecting the well-known pattern of earlier partnering among women, but we observe convergence in union prevalence by age 30. Figure 1C depicts the proportion of population in a higher-order (re-partnered) union by age group. It is important to note that the denominator in this case is the total population, and not the population that separated from a first union. By the age of 36, the overall prevalence of a higher-order union approaches 30%. Women are once again observed to be more likely than men to be in a (re-partnered) union. The difference ranges from five percentage points around the age of 27–29 to one percentage point by the age of 42–44. Finally, Fig. 1D depicts the prevalence of higher-order unions, but now as a percentage of the population who were divorced or separated by this age. According to this estimate, men have a higher share of re-partnered unions, but only after the age of 39 and by a magnitude of one to two percentage points. Conversely, women

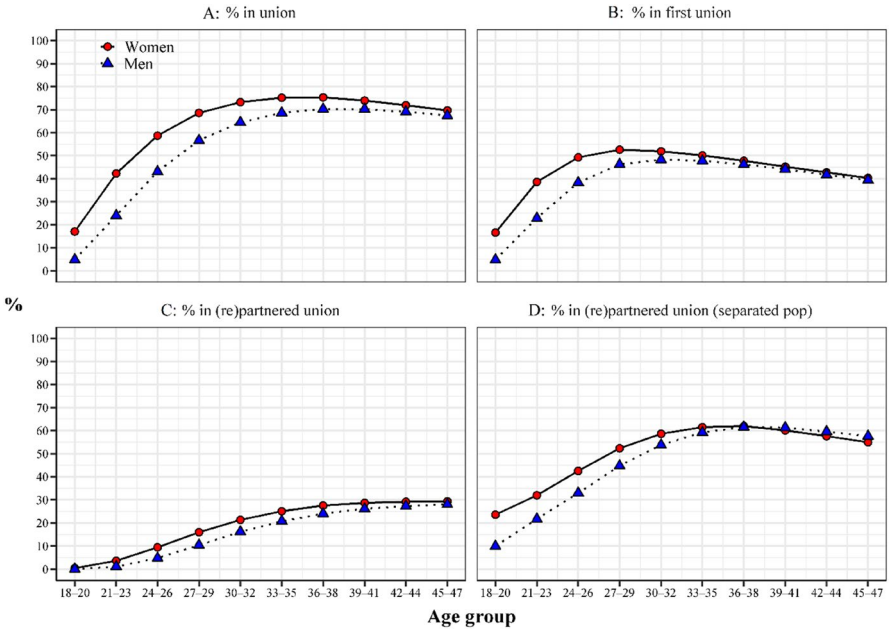

Fig. 1 Trends in partnering and re-partnering trends from the ages of 18 to 47. All members of the population were born between 1969 and 1973

who have separated from a first union are more likely (by up to eight percentage points) to be in a subsequent partnership. In summary, women are more likely than men to be in a first, re-partnered, or any union in Finland. Males have a small "re-partnering advantage" in later life. This disparity is observed when union prevalence is estimated as a percentage of separated individuals, which is the rate used by most previous studies that have demonstrated a higher union prevalence among men (e.g., Payne, 2018). In contrast, the greatest gender differences in re-partnering reveal a "female advantage," and this mostly occurs during prime childbearing years.

Cohort Fertility

Figure 2 depicts the cohort fertility of men and women. Consistent with the results of Jalovaara et al. (2018), the cohort fertility of women (1.89) is observed to be greater than that of men (1.7). Furthermore, consistent with the findings of previous research, births at younger ages account for more CFR in women than in men. We show that, in general, the union context of birth and the manner in which it affects cohort fertility are relatively similar. As summarized in the right upper corners of both plots, cohort fertility, which accounts for 69.5% of CFR for women and 69.2% for men is predominantly the consequence of births within the first union of men and women. For women, births in higher-order unions account for 26.1% of CRF, compared to 26.9% for men. In first unions, this translates to a negligible

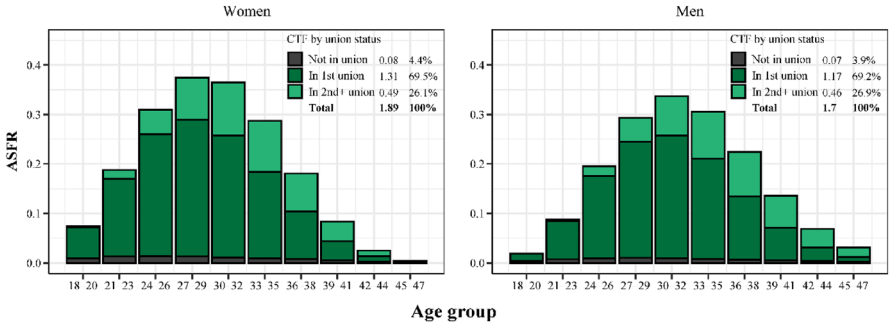

Fig. 2 Age- and union-specific cohort fertility from the ages of 18 to 47

minor gender difference of 0.3 percentage points, and in higher-order unions, the difference is 0.8 percentage points. Births outside of unions are rare, and correspond to 3.9% and 4.4% of CFR for men and women, respectively. In summary, there is a 0.19 magnitude difference between men's and women's cohort fertility, and a moderate-sized sex-difference in partnering, re-partnering, as well as birth rates. We now break down this CTF gender difference into factors resulting from gender disparities in age-specific union states and birth rates.

Partnering and Cohort Fertility

Figure 3 depicts a break down of the higher fertility of women, as seen in Fig. 2, expressed as a gender difference of − 0.19. Men's contributions to CFR are represented by bars above zero on the y-axis, while women's contributions to CFR are represented by negative values. The red/yellow portions of the bars depict the impact of gender differences on birth rates: Women are observed to have higher birth rates

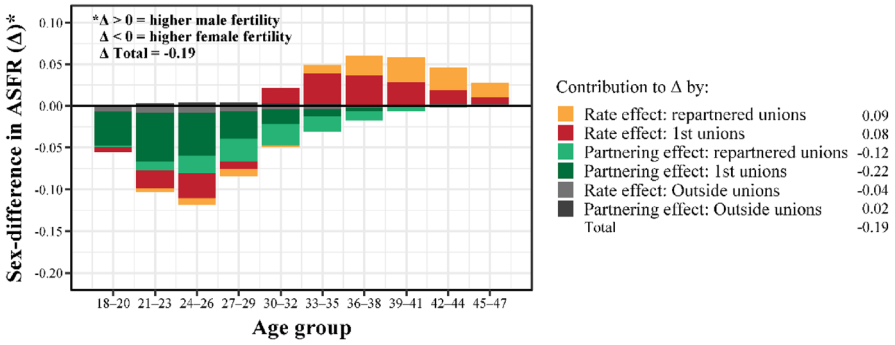

Fig. 3 Birth rate and compositional partnering effects on CFR gender differences. On the y-axis, positive values signify a fertility advantage for men, whereas negative values signify a fertility advantage for women. The red/yellow bars show the effect of sex differences in higher birth rate, and the green bars show the effect of sex differences in union status

in first (red) and re-partnered unions (yellow) up until the age of 29; therefore, they appear as negative values throughout these years and contribute to the CFR gender difference in favor of women. Men have greater birth rates than women do in both forms of unions at older ages, which contributes to the CFR gender difference in men's favor, and is represented by positive red/yellow bars from age 30 and on. The green portions of the bars represent the compositional effects, or the proportions of men and women in union at a particular age. Specifically, throughout the most common childbearing ages, gender differences in the proportion of population partnered in first unions (dark green) contribute to the CFR gender difference in women's favor from the ages of 18 to 41. This holds true for the proportion of population in re-partnered unions as well, albeit with a smaller effect. For men, however, partnering or re-partnering do not have any positive effect on CFR gender differences. Although men have a slightly higher re-partnering rate at older ages (as seen in Fig. 1D), absolute birth rates at those ages are low, and thus contribute little to CRF differences. Summarizing across age groups, men see a positive rate effect. However, because births are significantly more common within unions of any kind than outside unions, women's higher partnering prevalence (as seen in Fig. 1) contributes considerably more to female fertility than men's.

We repeat the previous analyses (Figs. 1–3) for the populations with and without tertiary education. Table 1 summarizes the analyses results. Overall, the patterns

Table 1 Birth rate and compositional partnering effects on CFR gender differences, by level of education & partnership experience

	Ever partnered		University degree		No university degree	
A: Partnering and re-partnering prevalence						
Male re-partnering higher at older ages	Yes		Yes (substantially)		Yes	
Female re-partnering higher at younger ages	Yes		Yes		Yes (marginally)	
Total female fertility higher at younger ages	Yes		Yes		Yes	
B: Cohort fertility rates						
CFR	M	F	M	F	M	F
	2.01	1.91	1.83	1.83	1.61	1.96
Δ CFR	0.1		0		-0.35	
C: Fertility rate decomposition (Δ > 0 = greater male fertility)						
Rate effect: repartnered unions	0.10		0.09		0.10	
Rate effect: 1st unions	0.09		0.10		0.06	
Partnering effect: re-partnered unions	− 0.11		− 0.10		− 0.17	
Partnering effect: 1st unions	− 0.16		− 0.08		− 0.29	
Rate effect: outside unions	− 0.03		− 0.02		− 0.08	
Partnering effect: outside unions	0.01		0.00		0.03	

"M" and "F" denote males and females, respectively

depicted in Fig. 1–3 are replicated in both the tertiary and non-tertiary educated populations, and when partnership experience is taken into account. There are, however, certain noteworthy qualitative and quantitative differences. The advantage of male re-partnering is more pronounced among the tertiary educated; the absolute cohort fertility difference is larger in the non-tertiary educated population, and the compositional effect of more women being in unions is stronger in this population. Nevertheless, the direction of all parameters in the decomposition exercise is consistent across subpopulations. Finally, we analyze the population using only the proportion of people who have ever been in a union. The results were similar to those displayed in Figs. 1–3. The complete results are presented as supplementary analyses in Appendix Figure 4–10.

Additional Analyses

After establishing our main findings, we turn to evaluate some underlying assumptions and explore heterogeneity with respect to partnering. First, we explore the influence and extent of childbearing after age 47. Using the 1969 cohort, who we measure to age 51, we see that three additional years of coverage reduce the gender gap by 0.01, owing to the rate effect of male fertility. Male birth rates decline rapidly between ages 47 and 51, suggesting the added effect of further coverage decreases drastically (Appendix figure 13 and Table 4, analysis (A). Next, we project "final" male fertility. We note that repartnered population may continue childbearing at older ages than the average population. Therefore, we calculate CFR measured at different cut-offs (age 47–65) among the 1954–1963 cohorts for the average as well as the remarried population (cohabitation is not available for older periods). CFR plateaus around age 60 for the repartnered, and 58 for the average population, in which CFR is about 1.5% higher than CFR measured at age 47. We aim at obtaining an upper bound of the influence of childbearing at older ages to the gender fertility difference and the role of repartnering therein. We, therefore, set the birth rates and union shares of our main sample to that of the observed age group 48–51 of the 1969 cohort. This leads to an overestimation rather than an underestimation of the influence of male fertility at higher ages, as we assume no decrease in ASFR after age 51. In the resulting decompositions (Table 4, analyzis B) we find that the CFR gender gap decreased by 0.04 (from − 0.19 to − 0.15). This decline is due to higher rate effects, not higher re-partnering rates among men at older ages. We also find the same pattern for the average population from a counterfactual exercise where the partnering composition from age 48–50 is set to that of the highly educated group, which is the most favorable in terms of "male repartnering advantage" that we observe in our data (Table 4, analysis C). We apply the same procedure for the education-specific estimates to obtain similar results (Table 4, analyses D & E). This leads us to believe that the core patterns observed by age 47 will persist, including the absence of a substantially significant "male re-partnering premium," although the gender gap in CFR is indeed reduced slightly by male fertility rates at later ages.

The characteristics of our observed union states may differ between men and women in ways related to childbearing. To tap into this heterogeneity, we explore

male–female marriage and re-marriage patterns by operationalizing in-union states as in-marital union states (Table 4, analysis F). These analyses do not suggest that compositional effects of re-marriage in older ages among men make up for the lower marriage rate during peak childbearing ages. We also separate our sample into two analytical samples: one which excludes those who separate from a first cohabiting union, and one which those who separate from a first marital union (Table 4, analyses G, H). Finally, as some previous work suggests that parental status or custodian arrangements lead to an average male re-partnering advantage, we analyze a subsample with those who experienced a (first entered) childbearing union (Table 4, analyses I). In all these analyses (Table 4, analyses F-1), the gender difference in CFR and its decomposed composition follows the pattern of the average population and no indication of a male re-partnering advantage enhancing effect on male fertility.

Discussion and Conclusion

It is becoming increasingly common that, within the primary reproductive ages, both men and women part ways with their first partners and move on to new ones. However, not everyone who dissolves a union enters into a new partnership. Previous studies have examined gender differences in the life course following union dissolution, often finding that men are more likely to re-partner, or transition between partnerships at a higher rate. This study investigates the argument that if men and women differ in their propensity to re-partner after a separation, this may influence gender differences in cohort fertility. Such an effect could be especially noticeable in serial monogamy societies like Finland, where union separation and re-partnering is common and a significant number of births occur in higher-order partnerships.

However, our findings do not support this contention. In Finland, we find no evidence that a higher male re-partnering advantage translates to a male fertility-advantage. This is due to two factors. First, men in Finland have higher re-partnership rates than women only at older ages. Both men and women have fewer children at these ages, though men have a higher rate of births at these ages than women. Second, for the majority of reproductive ages, women have a higher total union as well as relatively higher re-partnering prevalence than men. As a result, re-partnering has the same effect as partnering in general: being in a union is associated with higher fertility, and this effect is palpable when comparing male and female fertility, with female fertility being higher. In addition to heterogeneity in gender differences in partnering and re-partnering prevalence across education levels, our findings demonstrate heterogeneity in CFR gender differences. Among the tertiary educated population, men had higher first and re-partnered union rates than women in some age groups. However, again, given that this advantage is not in prime reproductive ages, it does not translate into a considerable fertility premium for men over women.

These findings provide a population-level perspective to previous studies that have examined individual-level predictors of re-partnering and birth risks across partnerships and the gender differences therein. This study bridges insights from the literature on gender differences in re-partnering and gender differences in births

across partnerships by presenting an approach to connect the two. This enables us to emphasize, for instance, the basic insight that gender differences in re-partnering have an age gradient, and that this age gradient strongly moderates the relationship between partnering and fertility. Although men may experience a higher re-partnering rate than women at later ages, it could have limited impact on total fertility as births are rare at older ages. Additionally, we have reinvestigated gender differences in re-partnering using data and a research design that has several advantages over most previous studies, including using (re)marriages and co-residential unions across the life course of an individual, as well as complete male and female birth cohorts. This study is also an attempt to analyze fertility processes while taking account and explicating the conditions of serial monogamy. Re-partnering will be important for continued childbearing and, ultimately, for cohort fertility once the historical link between entering a first union and entering parenthood is decouples. Here, our analytical approach can be applied in a comparative setting across different contexts or time periods. In a future where childbearing is continued to be postponed ever further into older ages, for instance, a male re-partnering advantage may substantially increase men's CFR relative to women's provided that current patterns of dissolution and re-partnering continue.

To what extent can these findings from Finland inform the relationship between gender gaps in re-partnering and fertility in other contexts? The contextual factors that we argued would augment the effect of partnering patterns on fertility (parity and union dissolution) are present in Finland. Higher-order parity births are non-negligible, so births after a first union dissolution (which tend to be of higher parity) could have a more significant impact than in countries like Germany, where first births drive fertility. Similarly, the stock of divorced and re-partnered is comparably high in Finland, making for a higher potential impact of gender differences in re-partnering on the gender gap in fertility than in many other countries. Hence, simply extrapolating from the present results means that the influence of repartnering would be even less salient in many other countries. As we show, however, the gender differences in the stock of re-partnered at the prime childbearing ages are decisive. From this finding, we can speculate that the most likely countries to see a "male repartnering advantage" are those with very late entry into parenthood, high union dissolution rates, and higher male than female re-partnering. We found a (marginal) "male re-partnering advantage" among the higher educated. It may be the case that universal welfare and high female labor force participation lessen the demand for male resources on the partner market and mitigates differences in re-partnering. In that case, we may expect an even more significant male advantage where for example, welfare is distributed at the level of the household or where the male breadwinner norm remains prevalent, as is conservative welfare regimes.

In relation to the previous findings of higher re-partnering among men, this study indicates that the relationship of this phenomenon for cohort fertility is not straightforward. First, the empirical evidence is far less conclusive when considering individuals in a higher-order non-marital union as re-partnered, as we do in this study. Second, attention to the denominator matters when considering the implications of partnering and repartnering on aggregate fertility: we show that the male re-partnering advantage can be prevalent among the separated population, as do much

previous research. When also considering all individuals in a union or in a re-partnered union, which is relevant for effect on fertility, there is less of a re-partnering advantage.¨

This study has several limitations that future research may focus on. Importantly, future research can extend our study by examining a greater age span. Our analyses suggest that the influence of male fertility after the ages not covered in this study is moderate to marginal. More precisely, male fertility at older ages does matter at the margin for differences in cohort fertility, but higher rates of male re-partnering are not the driver. Yet, the behavior at older ages still warrants care as, for example, (future) repartnering rates among the studied cohorts are unknown. Gender-age-fertility dynamics may relevant for how higher-order unions in particular produces gender differences in cohort fertility (e.g., Beaujouan & Wiles-Portier, 2011). Although the intention and capacity to have children after a union's dissolution will undoubtedly drive some aspects of re-partnering behavior, we have remained agnostic to the antecedents of men's and women's re-partnering and fertility behavior, as well as to the causal order between re-partnering and fertility throughout the study. However, by providing observational descriptions of the combined demographics of partnering, re-partnering, and births, this study makes a significant contribution to extant literature. Our findings pave way for future research, including causal analyses, on partnership trends and gender disparities in fertility. Another limitation is that Finnish registers do not include detailed information on household composition, qualitative information regarding custodial arrangements, and the involvement of non-resident parents found in the survey material. Likewise, despite a good coverage of non-marital cohabitation, other salient partnerships are not operationalized by the data, such as couples living apart together (LAT), and couples not domiciled where they are registered are not covered by our data. These factors are likely to have an impact on fertility in higher-order unions, and a more detailed account of gender differences in these parameters may help us better understand this topic.

The intersection of gender and partnering is critical to contemporary fertility dynamics theory. Empirical research on the relationship between gender differences in partnering and those in fertility has received relatively little attention, possibly because fertility studies are mostly focused on women. By addressing this research gap, this study paves way for future research on population fertility.

Appendix

See Fig. 4, 5, 6, 7, 8, 9, 10, 11, 12 and 13

See Table 2, 3 and 4.

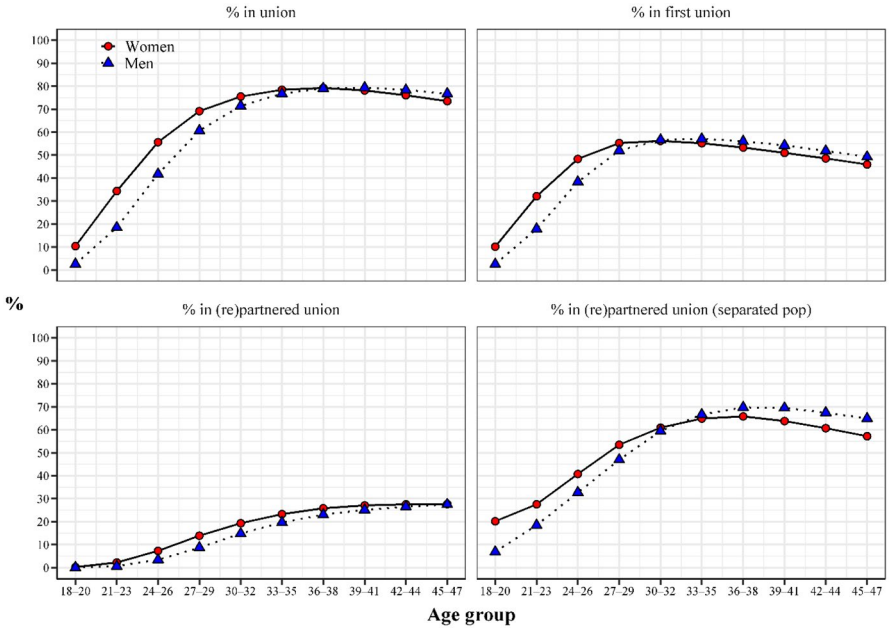

Fig. 4 Trends in partnering and re-partnering trends from the ages of 18 to 47. All members of the population were born between 1969 and 1973. Tertiary educated

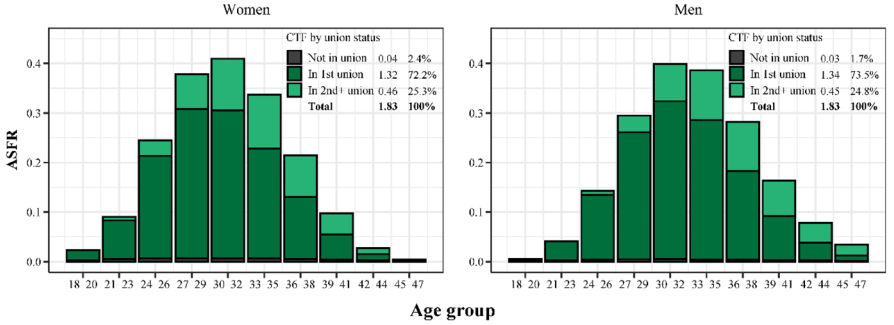

Fig. 5 Age- and union-specific cohort fertility from the ages of 18 to 47. Tertiary educated

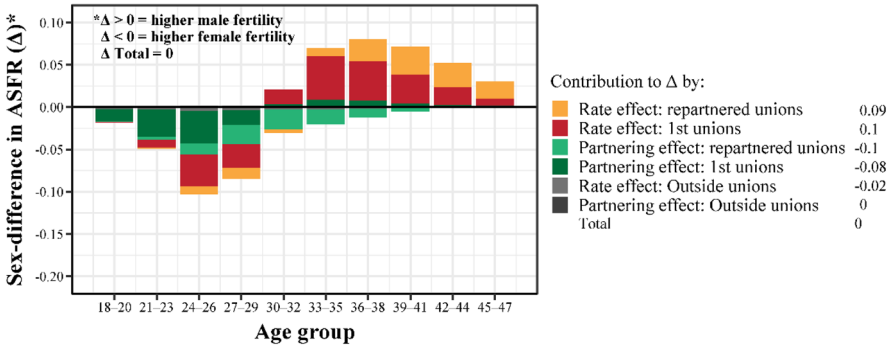

Fig. 6 Birth rate and compositional partnering effects on CFR gender differences. Tertiary educated

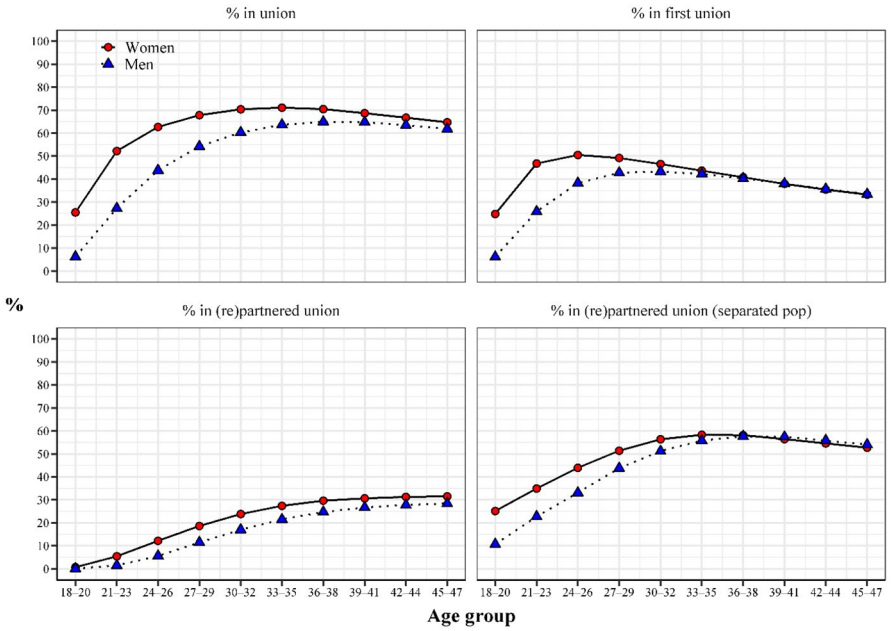

Fig. 7 Trends in partnering and re-partnering trends from the ages of 18 to 47. All members of the population were born between 1969 and 1973. Non- tertiary educated

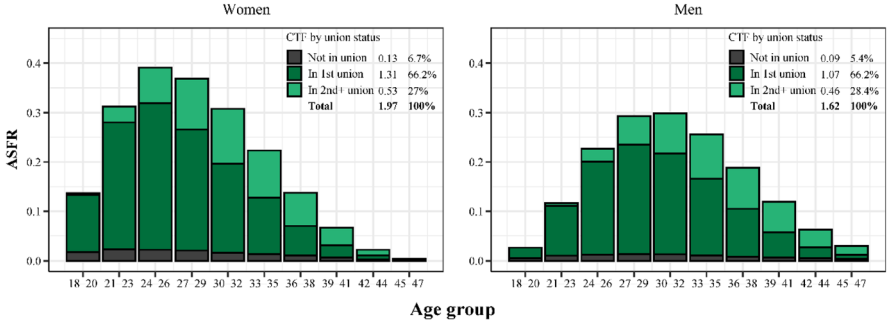

Fig. 8 Age- and union-specific cohort fertility from the ages of 18 to 47. Non- tertiary educated

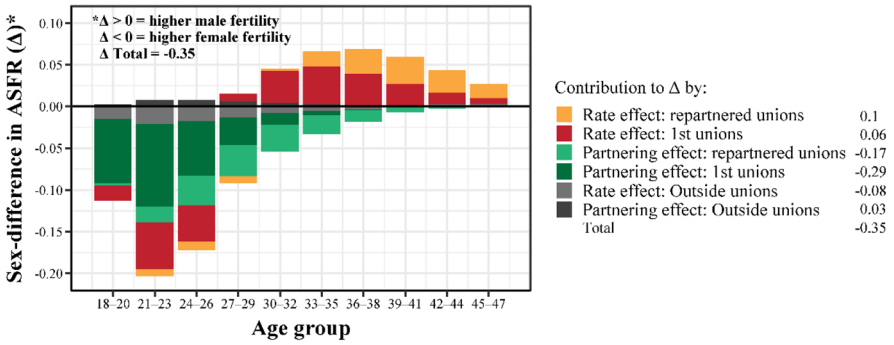

Fig. 9 Birth rate and compositional partnering effects on CFR gender differences. Non- tertiary educated

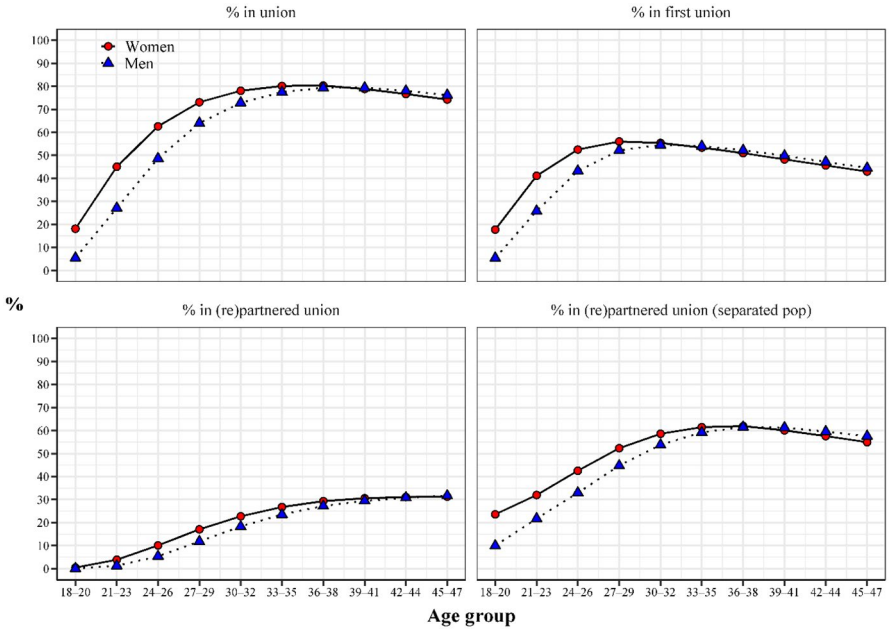

Fig. 10 Trends in partnering and re-partnering trends from the ages of 18 to 47. All members of the population were born between 1969 and 1973. Ever-partnered

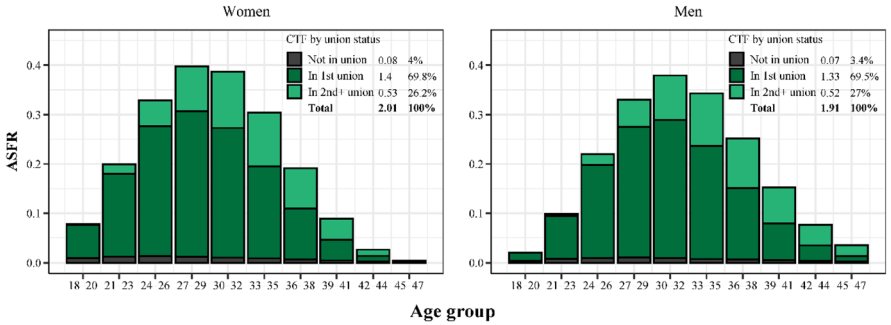

Fig. 11 Age- and union-specific cohort fertility from the ages of 18 to 47. Ever-partnered

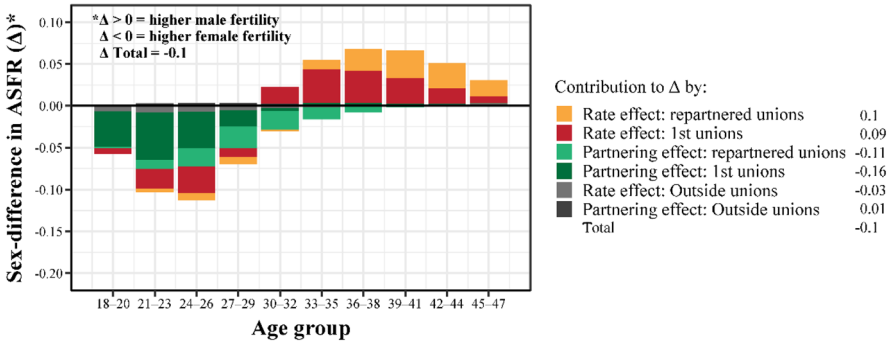

Fig. 12 Birth rate and compositional partnering effects on CFR gender differences. Ever-partnered

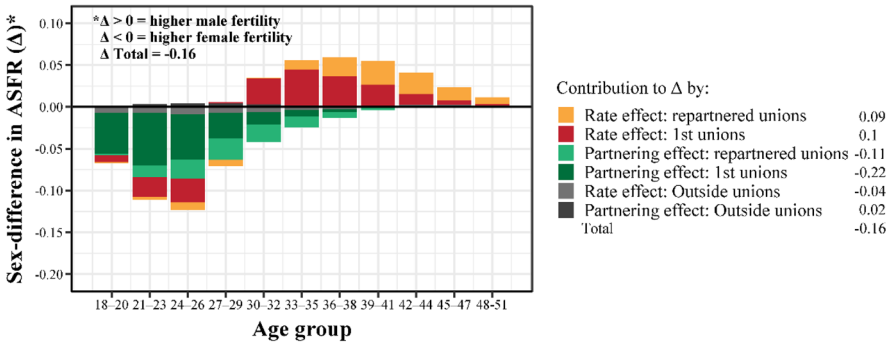

Fig. 13 Fig. 3 Birth rate and compositional partnering effects on CFR gender differences, age 18–51, 1969 birth cohort

Table 2 Study population person-years and births events by union status for men and women

	Total		Tertiary educated		Non-tertiary educated		Ever-partnered	
	PY	Births	PY	Births	PY	Births	PY	Births
Women								
Not in union	1510379	11,208	834314	3351	676065	7857	1260658	10010
In 1st union	1756170	176631	1028317	99,206	727853	77425	1756170	176631
In re-partnered union	769299	66418	393323	34,821	375976	31597	769299	66418
Men								
Not in union	1938502	9197	655951	1616	1282551	7581	1456171	8158
In 1st union	1594835	164399	688613	70,842	906222	93557	1594835	164,399
In re-partnered union	667287	63981	236143	23884	431144	40097	667287	63981

Table 3 Study population frequency across educational level and ever-partnering status

	Women		Men	
	N	%	*N*	%
Educational level				
Non-tertiary educated	59390	0,44	87331	0,62
Tertiary educated	75230	0,56	52691	0,38
Ever-partnered				
Never-partnered	8344	0,06	16078	0,11
Ever-partnered	126276	0,94	123944	0,89

Table 4 Birth rate and compositional partnering effects on CFR gender differences, different specifications

Specification	A: 1969 cohort (18–51)	B: Projection I (18–60)	C: Projection II (18–60)	D: Projection 1 Non tertiary (18–60)	E: Projection 1 Tertiary (18–60)	F: marriage & remarriage (18–47)	G: re-partner after cohabitation (18–47)	H: re-partner after marriage (18–47)	I: re-partner after parental union (18–47)
Δ CFR	− 0.16	− 0.15	− 0.15	− 0.31	0.05	− 0.19	− -0.08	− 0.07	− 0.23
Rate effect: repartnered unions	0.09	0.12	0.12	0.13	0.12	0.03	− 0.08	0.06	0.2
Rate effect: 1st unions	0.1	0.09	0.09	0.07	0.12	0.21	0.01	0.19	− 0.08
Partnering effect: re-partnered unions	− 0.11	− 0.12	− 0.12	− 0.18	− 0.1	− 0.02	− 0.19	− 0.07	− 0.38
Partnering effect: 1st unions	− 0.22	-0.22	− 0.22	− 0.29	− 0.08	− 0.34	− 0.03	− 0.24	− 0.04
Rate effect: Outside unions	− 0.04	− 0.03	− 0.03	− 0.07	− 0.01	− 0.15	− 0.03	− 0.02	0.02
Partnering effect: Outside unions	0.02	0.02	0.02	0.03	0	0.09	0.01	0.01	− 0.23

A: 1969 cohort (age 18–51) (Figure A10), B: Projection (age 18–60), C: Projection (age 18–60) high male partnering scenario, D: Projection (age 18–60) Non-tertiary educated, E: Projection (age 18–60) Tertiary educated, F: Full Main sample (age 18–47) Marriage and Re-marriage, G: Main sample (age 18–47) exc. population with marital first unions, H: Main sample (age 18–47) exc. population with non-marital first unions. I: Main sample (age 18–4) population with a first entered childbearing union

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Declarations

Conflict of interest I have no conflict of interest to disclose.

Ethical approval Ethical approval and data provision was granted via Statistics Finland (No. TK5373116).

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