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Parity disparity: Educational differences in Nordic fertility across parities and number of reproductive partners

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Abstract

Most research on trends in socioeconomic fertility differences focus on cohort total fertility. This study asks how cohort trends in parity-specific fertility differ across educational segments for men and women, and what role multi-partner fertility plays in these trends. The study used Finnish and Swedish register data on cohorts born in 1940–1973/1978. The main analyses use parity progression ratios. Ordinary ratios were contrasted with ratios on births to first reproductive partner. Among low- and medium-educated persons we observe parity polarization, where both childlessness and higher parity (3+) births increase, largely reflecting increases in multi-partner fertility. Highly educated men and women more often have exactly two children. We demonstrate that cohort total fertility can mask significant parity-specific trends across educational groups, and that changes in multi-partner fertility can be a part and parcel of cohort trends in socioeconomic fertility differentials.

Keywords: Fertility, parity, cohort, childlessness, gender, education, socioeconomic, multi-partner fertility, parity progression ratios, Nordic countries

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Introduction

Socioeconomic differentials in childbearing patterns is a core demographic topic that is also of broad societal importance. Understanding the varying linkages among fertility and dimensions of individuals' social and economic status such as income, education, and occupational class has proven to be an elusive task (Jones and Tertilt 2008; Kravdal and Rindfuss 2008; Skirbekk 2008). By and large, the predominant pattern in most developed, low-fertility countries is a moderately positive association between socioeconomic resources (income or educational level) and completed fertility for men, and a negative association for women (Kravdal and Rindfuss 2008; Zeman et al. 2014; Sobotka, Beaujouan & Brzozowska. 2017). Recently, trends towards convergence in men's and women's socioeconomic fertility gradients have been observed (Winkler-Dworak and Toulemon 2007; Kravdal and Rindfuss 2008; Kneale and Joshi 2008; Van Bavel 2012; Zang 2019). In Nordic countries, such trends are particularly clear. A positive association has persisted between men's education and income and their fertility (Jalovaara et al. 2018; Kolk 2019), whereas the initially negative educational gradient in women's fertility has vanished in most Nordic countries. In examining women's lifetime childlessness, gradients have even reversed, leading to higher childlessness levels for women with low levels of education (Jalovaara et al. 2018).

Most previous studies on trends in socioeconomic fertility differences have focused on cohort total fertility (CTF) and, in some cases, levels of ultimate childlessness. Limitations include the fact that measures based on averages effectively mask any differences and trends in parity-specific fertility (Wood et al. 2014): that is, birth risks conditioned on the number of previous births. Moreover, the analyses do not distinguish between completed fertility attained through childbearing with just one partner and childbearing with several partners, referred to as 'single-partner fertility' (SPF) and 'multi-partner fertility' (MPF). As the variance in both the number of children and the number of childbearing partners are substantive aspects of fertility change and socioeconomically stratified fertility patterns (Seltzer 2019), we claim that research on trends in socioeconomic fertility differentials would benefit from their integration into the analyses. First, trends in socioeconomic differences in fertility behaviour can be parity specific (Schoen 2006). For example, increases in lifetime childlessness and increases in higher-order births (beyond the mean number of children) can occur simultaneously within one population subgroup. Such patterns, referred to here as 'parity polarization', as well as any other characteristics of the distribution in the numbers of children, are obscured using measures based on averages, such as cohort total fertility

(Zeman et al. 2018). Second, socioeconomic differences in fertility across cohorts are influenced by socioeconomic differences in partnering, separation, and childbearing with second and subsequent reproductive partners. Partnership dynamics may impact completed fertility over and above what would be predicted from, for example, economic theories on income effects on and the opportunity costs of childbearing (Thomson at al. 2012). Understanding the significance of MPF for cohort trends in socioeconomic fertility differences is therefore useful for assessing the validity of different theories on fertility change.

The present paper contributes to understanding trends in socioeconomic fertility differentials by focusing on two Nordic countries—Finland and Sweden—and addressing two questions. First, how do cohort trends in parity-specific fertility differ across educational segments for men and women? Second, what is the role of MPF in educational differences in parity-specific fertility across male and female cohorts? The study used up-to-date register data with full population coverage for the two countries to calculate measures of cohort fertility. The main analyses used parity progression ratios (PPR) of completed cohort fertility for women and men born between 1940 and 1973/1978 stratified by educational attainment. The ordinary PPRs estimated from all births are contrasted with PPRs calculated from births to the first reproductive partner only. The results are compared to and supported by other measures, including CTF, childlessness, CTF at parity>0, and relative parity distributions.

To date, Nordic countries have been forerunners in developments that may be highly relevant for understanding changes in fertility. These include changes in partnership dynamics, such as decline in marriage, increase in cohabitation and childbearing in cohabitation, and high levels of separation and divorce (Surkyn and Lesthaeghe 2004; Sobotka and Toulemon 2008). Cohort fertility levels in Nordic countries have remained fairly stable and close to population replacement levels across past decades, and continue to show stability despite declines in period fertility levels since 2010 (Hellstrand et al. 2020). Nordic countries are also forerunners in developing gender equality and in the adoption of the dual-earner family model (Esping-Andersen 2009), as well as in developing social equality. Women's labour force participation rates are high (OECD 2020). As with most other European societies, they have witnessed a remarkable expansion of participation in higher education, which is particularly pronounced among women (OECD 2019). Today, these countries see fundamental shifts in educational gradients in childbearing patterns, especially among women. The possibility that the Nordics are spearheading a more comprehensive

transition in gendered fertility patterns across developed societies makes Nordic developments relevant internationally.

Finland provides an intriguing case for the study, as previous research indicates that parity polarization into childlessness and higher parities is stronger in Finland than in other Nordic countries. A comparison with Sweden informs whether the Finnish patterns are unique or shared by another, more typical representative of the Nordic fertility regime (Andersson et al. 2009).

Socioeconomic Status, Gender, and Fertility

Microeconomic theory of the relationship between socioeconomic status and fertility emphasizes that, while childbearing entails rewards, it also comes with high (direct) costs. Similar to other cases when what is in demand is also expensive, individuals with greater economic resources are able to carry such costs and may therefore be predicted to have more children (see Bergstrom 1996). Given the high demand for skilled and specialized labour in highly advanced societies, educational level is a key determinant of individuals' occupational success, earning prospects, and wealth (Stevens et al. 2008). An individual's high educational level is therefore expected to promote fertility. Fertility behaviour most often takes place among couples who share a household. Whether the household unit operates under a dual-earner or sole (male) breadwinner, the economic model is crucial for how socioeconomic patterns in fertility differ between men and women (Lundberg and Pollak 1993).

However, there are strong reasons to believe that the marginal utility of childbearing decreases with each child. Individuals (or couples) may practise 'stopping behaviour', meaning that once their preferred parity is reached, childbearing stops, even though continuing would seem financially bearable (Yamaguchi and Ferguson 1995). In the case of the present study's countries and cohorts, following the two-child norm has been widely preferred and idealized (Sobotka and Beaujouan 2014).

Childbearing and childrearing come with both direct but also indirect costs. When (potential) earnings increase, so do the opportunity costs of time and energy sacrificed from paid work to parenting. Therefore, the hypothesis based on the opportunity costs of childbearing predicts a negative association between individuals' earnings potential and fertility. As mothers often are the main caregivers of their children and childbearing tends to influence mothers' work careers more than that of fathers', opportunity costs are particularly poignant for women (Oppenheimer 1994; Waldfogel 1998; Budig and England 2001). An

extreme example of such costs are trade-offs between work career and family formation that may result in higher levels of lifetime childlessness among particularly career-oriented women (Oppenheimer 1988).

In summary, a higher level of socioeconomic resources can positively impact fertility via the direct costs (income effect) as well as a negative impact via the indirect costs (opportunity costs effect). Most accounts suggest that the income effect steers socioeconomic gradients in men's fertility (Kravdal and Rindfuss 2008; Nisén et al. 2018), while for women the opportunity costs are usually considered the dominant mechanism (Oppenheimer, 1994). The strength of these opposing forces presumably varies across time and societal context. Institutional support to families, such as children's daycare and extensive parental leave schemas, help both parents to pursue their work careers in parallel to building a family (McDonald 2000). Where men's uptake of domestic and childrearing labour is greater, the opportunity costs of childbearing for women are further reduced (Goldschneider, Bernhardt, and Lappegård 2015). Nordic countries are characterised by comparably strong support for gender equality in the public as well as private spheres, and various policies facilitate the combination of paid work and family formation (Neyer et al. 2013). It is therefore possible that these countries have succeeded in significantly reducing opportunity costs of childbearing that in other contexts might be severe, especially for highly educated women.

The implications for future fertility regimes are apparently straightforward. As women's and men's social and economic roles converge and gender equality advances in public and private spheres, the opportunity costs of family formation for women diminish and, as a result, the effects of women's socioeconomic resources on fertility become increasingly similar to the effects of men's resources. Hence, the overall socioeconomic gradient in fertility becomes gender neutral and overwhelmingly positive.

Individuals' socioeconomic resources influence fertility not only by affecting couples' fertility but also by impacting union formation and union dissolution. With changes in partnership dynamics, such as increases in separation and divorce, its significance for fertility likely increases. In gender-egalitarian societies where women's and men's domestic and economic roles are increasingly similar, both men's and women's economic resources are an asset in the partner market and more consistently and positively affect partnership formation and partnership stability (Bracher and Santow 1998; Cooke et al. 2013). Union dissolution has a depressing effect on fertility at all parities, particularly on childlessness. Lower total fertility and higher lifetime childlessness, often linked to never partnering or partnership

instability (Keizer et al. 2008; Jalovaara and Fasang 2017), are increasingly common among women (and not just men) in the lower socioeconomic strata, and more mothers (and not just fathers) especially in the lower strata will see their unions dissolve during childbearing years.

Men and women in lower socioeconomic strata tend to have higher birth rates at high parities (e.g. Ruggles 2015). Several reasons for this are proposed, ranging from higher rates of unintended fertility (Musick et al. 2009) to early ages at first birth (Morgan and Rindfuss 1999), as well as a negative effect of fertility on educational attainment (Baizán and Martin-Garcia 2006). Another factor, the importance of which may be on the increase, is MPF. Having children with more than one partner is the fertility-related result of several processes that have a strong socioeconomic gradient, including early age at first birth, pregnancy outside co-residing unions, and union instability (Thomson 2015). In younger cohorts, increasing numbers of individuals at childbearing ages have separated or divorced and are re-partnering. Hence, MPF may become more prevalent especially in groups where rates of partnership dissolution are highest, that is, among men and women with fewer socioeconomic resources (Guzzo and Furstenberg 2007; Lappegård and Rønsen, 2013; Manlove et al., 2008; Monte 2018; Thomson et al., 2014; Jalovaara and Kreyenfeld 2020). Re-partnering and MPF promote childbearing at higher parities as a new union may encourage childbearing regardless of the parity reached by the partners before entering the partnership (Griffith et al. 1985; Holland and Thomson 2011). Thus, while union dissolution has a negative effect on overall fertility, the process of re-partnering can have a positive effect on progression to higher order parities.

The notion that the fertility behaviour of men and women converge within socioeconomic groups finds tentative support in reports on trends in completed cohort fertility and childlessness (Jalovaara et al. 2018). Influential previous research has suggested that partnership dynamics increasingly impact socioeconomic gradients in fertility (Thomson et al. 2012). Still, an empirical description of cohort trends necessary to refute or validate whether these fertility developments are in fact taking place is yet to be provided. This study argues that it is useful to consider specific parities and MPF when analysing socioeconomic differentials in fertility through the lens of income effects, opportunity costs, and partnership dynamics. For example, beyond the ability to bear the costs of having children, socioeconomic position operates partly via (non)partnering for childlessness; via union (in)stability for all births, and via parents' re-partnering for second and higher-order births. The average rates of cohort fertility might be unable to tap changes in childbearing at

different parities. Notwithstanding great interest in the increasing overrepresentation of MPF among those with fewer socioeconomic resources, the influence of MPF on socioeconomic fertility differentials has not been incorporated into research on cohort fertility trends (But see Beaujouan & Solaz 2008; Churilova et al 2017; Thomson, Winkler-Dworak, Spielauer, Prskawetz). To substantiate the role of partnership dynamics this study distinguishes rates derived from all births from rates that exclude MPF births.

Together, the above developments entail that with each birth cohort, the positive effect of socioeconomic resources for fertility becomes more salient for women, and union dissolution becomes increasingly prevalent among medium and low educated men and women, both suppressing fertility of low and medium educated relative to the highly educated. However, there are no *a priori* reasons to expect a decrease in the stronger tendency to transition to higher parities among low- and medium-educated individuals. Based on this narrative, we predict that medium- and low-educated women and men will display a trend towards parity polarization: with each passing birth cohort, low and medium educated will be more likely to remain childless and more likely to proceed to higher (e.g. third and subsequent) parities (Hypothesis 1).

Second, we predict that across cohorts, births to higher order reproductive partners will increasingly contribute to the differences between educational groups in the progression to second and subsequent births (Hypothesis 2).

When interpreting trends across educational groups, it should be kept in mind that, towards more recent cohorts, increasing proportions of men and women attain secondary and tertiary education. Hence, in each birth cohort, those with no education beyond the basic level diminish in size and become a progressively marginalized population segment in terms of social and economic characteristics. This strengthens their disadvantages in both the labour and partnership markets. With increases in tertiary education, similar processes could to some extent apply to persons with secondary level education—the secondary educated, however, represent a large educational group across all birth cohorts.

Data and Methods

For both Finland and Sweden, the study used individual-level data drawn from population registers and registers of completed educational degrees. The data cover the entire populations of the respective countries. With personal identification numbers that were anonymized at Statistics Finland and Statistics Sweden, we linked individuals' data records

on births, registered (biological) mothers and fathers, deaths, migration, and educational degrees.

The study population comprised of individuals born in each respective country that included women born between 1940 and 1978 to measure ultimate fertility and childlessness at age 40, and men born between 1940 and 1973 to measure fertility status at age 45. A small minority have children after these ages. We decided that the coverage lost by limiting the age-span to 40 and 45 was compensated for by the possibility to include more recent cohorts. By focusing on individuals born in the country, the study followed the logic of a true birth cohort design: that is, the idea that cohorts of individuals born in a certain region are followed across their entire lives. By using these selection criteria, the study also avoided problems related to absence of data on, for instance, completed educational degrees, for the time preceding immigration. The analyses excluded data on individuals not registered as living in the respective country in the year they turn 40 (women) or 45 (men), that is, those who had died, or emigrated but not returned.

All analyses were performed separately for men and women. Results are reported for 5-year birth cohorts with the exception of the groups that consist of the 1970–1973 cohort for men and the 1975–1978 cohort for women, reflecting that 2018 is the last year we had data for (compared to a recent Nordic fertility comparison (Jalovaara et al. 2018), this study added six yearly cohorts.)

MPF was identified by comparing the anonymized personal identification numbers of reproductive partner(s) across children born to index-persons, a reproductive partner referring to the other registered (biological) parent of the child. In surveys men under-report births, especially to previous partners (Rendall et al. 1999; Gray and Evans 2008). This measurement bias underestimates the total prevalence of MPF and lowers levels of MPF among fathers (Guzzo and Dorius 2016). In register data, men's fertility histories are almost as completely covered as those of women. However, about 2% of children have no father registered. When the other parent is unknown (not registered) in two subsequent births, we assumed the births were to the same partner, but if the parent of one child is registered and the other one is not, we assumed the births were to different partners.

The analyses first focused on cohort trends of parity-specific fertility across educational segments for men and women, and second, on contrasting parity-specific fertility calculated from all births to parity-specific fertility calculated only from first reproductive

partners. The study started by describing completed fertility with CTF (mean numbers of children born), ultimate childlessness (%), and CTF among those who had at least one child. Second, the study analysed births at each parity using parity progression ratios (Preston, Heuveline, and Guillot 2000). PPR represents the quantity of births of parity x+1 divided by the quantity of births in parity x. PPR provides the proportion of persons who progressed from one parity to the next. They were calculated separately for each cohort set, gender, and educational level (Equation 1). The resulting PPRs were used to analyse cohort trends in parity-specific fertility across educational levels. To show the role of MPF in educational fertility differences the study built on the PPRs (Equation 1) to construct another simple measure. First, to obtain single point estimates of educational differences in parity progression, we subtracted the PPR of the tertiary educated from the PPR of all other educational levels separately (Equation 2). Next, we repeated Equations 1 and 2 but only counting the births of individuals from the first reproductive partner, representing single-partner fertility. To parsimoniously present the contribution of MPF to the educational differences in parity progression, we contrasted the PPR difference to the SPF-PPR difference (Equation 3). The analysis focused on transition rates rather than the distribution of final parities, but for completion we presented cohort parity distributions of total number of children born in appendix figures (S4–S7).

$$a_{parity_{educ}} = \frac{Parity_{educ}+1}{Parity_{educ}} \quad (1)$$

$$\Delta a_{Parity_{educ}} = a_{Parity_{Tertiary}} - a_{Parity_{educ}} \quad (2)$$

$$\Delta aSPF_{Parity_{educ}} = aSPF_{Parity_{Tertiary}} - aSPF_{Parity_{educ}} \quad (3)$$

As with most previous studies, this study measured socioeconomic status as the highest obtained level of education. Education level refers to the highest level of education achieved before 2018. The association between educational attainment and childbearing is sensitive to the age at which these were measured, one reason being there is a two-way link between education and childbearing (Hoem and Kreyenfeld 2006). For example, having children at a young age may lead to discontinued education. We chose the highest-ever approach because of the absence of data on the timing of degree completions for older cohorts. The categories were collapsed into three groups using the International Standard Classification of Education (ISCED) (UNESCO 2012): low education, referring to basic education or less (ISCED 0–2); medium education, referring to (upper) secondary education

(ISCED 3–4), and high education, comprising lower and higher tertiary levels (ISCED 5–8). For Finland, the information was obtained using Statistics Finland's register data on post-basic educational degrees, meaning that the lowest level was inferred from the fact that the data are missing. For Sweden, individuals with missing data on educational degrees (4%) were excluded from the sample.

Supplementary Table S1 shows educational distributions in the female and male study cohorts. Levels of education attained have risen markedly across study cohorts, especially among women. The expansion of education begins with an increase in those who receive secondary level education. The proportion of persons whose highest educational qualification is at secondary level has already declined, as an increasing proportion of women and men have completed tertiary degrees. Of women born in 1975–78, the majority had completed tertiary-level education. Among men, tertiary qualifications have also become more common, but for half of men in the most recent cohort in both countries completed secondary education marks their highest level of education. Meanwhile, the proportion of persons with no education beyond the basic level has declined to between 5–14%. In Finland, levels of educational attainment are somewhat higher, especially for women, but beyond that the differences between the two countries are small.

Supplementary Figures S1 (Finland) and S2 (Sweden) show the percentages of mothers and fathers who had children with more than one partner by birth cohort and educational level. In Finland, having children with multiple partners increased steadily across the study cohorts, while in Sweden, MPF became more common earlier and the overall levels show even a slight decline across the study cohorts. In both countries, MPF increased very strongly among men and women with the lowest levels of education, and in Finland, increases are notable among medium-educated parents as well. In Sweden, MPF has even declined among tertiary educated parents. In the youngest cohorts of both countries, MPF is inversely and strongly associated with educational level for both men and women. Supplementary Tables S2 (Finland) and S3 (Sweden) show changes in MPF between the first and last study cohort by parity. MPF becomes more common towards higher parities. However, in both countries, the MPF has become rather common among low-educated parents even at parity two.

Results

Introductory Analysis: Educational Differences in Cohort Total Fertility and Childlessness

To provide background for the parity-specific analyses, we examined trends in CTF, ultimate childlessness, and CTF among parents—that is, those who had at least one child (parity>0). Childlessness levels and CTF among parents disaggregated CTF into entry into parenthood (first birth) and higher parities, and provided first evidence of parity-specific trends potentially masked by CTF.

Figure 1. Cohort total fertility, childlessness (%), and cohort total fertility among parents at age 40 by education and cohort for women born in Finland between 1940 and 1978.

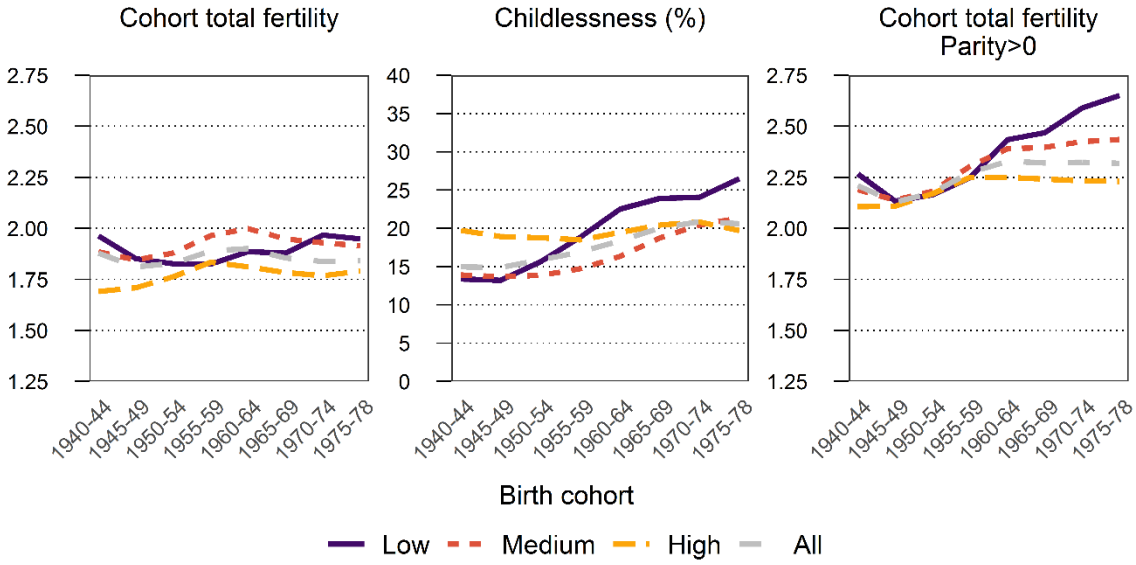


Figure 1 shows the results for women in Finland. The educational differences in the CTF remained fairly stable across cohorts. In the youngest cohort, highly educated women still had slightly fewer children on average than women with lower education levels. This stability in CTF contrasts starkly with the changes in educational gradients in ultimate childlessness and CTF among mothers (parity>0). In the oldest study cohorts, childlessness levels were highest for highly educated women. Across the cohorts, childlessness levels increased strongly among low- and medium-educated women but remained stable among highly educated women and, as a result, the levels for the lowest educated women are now by far highest in Finland. However, among low- and medium-educated women who had at least one child, CTF significantly increased across the 1960s and 1970s cohorts. This suggests a strengthening parity polarization among low- and medium-educated women where lifetime childlessness is increasing, but at the same time women who become mothers increasingly

enter higher parities. The results for highly educated women in Finland do not imply such diverging trends; not only CTF but also childlessness levels and CTF among mothers remain fairly stable across the study cohorts.

As for Finnish women, the results for Finnish men (Figure S3) suggest different parity-specific developments across educational groups. A consistent, inverse association between educational level and CTF continues to persist across all cohorts, highly educated men had on average more children than men with lower educational levels. In terms of men's ultimate childlessness, a strong negative educational gradient continues to persist. However, among men who had at least one child, no educational differences in CTF are observed. In other words, men with lower educational levels are more likely to remain childless, but if they do become fathers, their average numbers are the same as those of highly educated fathers. These trends imply a parity polarization among low- and medium-educated Finnish men, although the patterns somewhat differ from those of Finnish women.

Similar overarching trends that suggest different parity-specific trends in educational segments, but which are masked by stability in CTF, are found among the Swedish population. The figures are omitted for parsimony but reported in the supplementary figures below (Figures S4 for women and S5 for men). The main difference between the two countries is that in the Swedish population, the signs of parity polarization into childlessness and higher parties are weaker and limited to the lowest educated women and men.

For women in Sweden, we observe a negative educational gradient in completed fertility effectively disappearing over time, as fertility levels of low-educated women decline below the levels of medium- and highly educated women. This change is completely driven by a strong increase in lifetime childlessness among women with low levels of education. Compared to more highly educated women, low educated women in recent cohorts more often proceed to higher parities, and low educated mothers therefore continue to have larger average numbers of children than highly educated mothers.

Figure 2. Parity progression ratios by education and cohort for women born in Finland between 1940 and 1978.

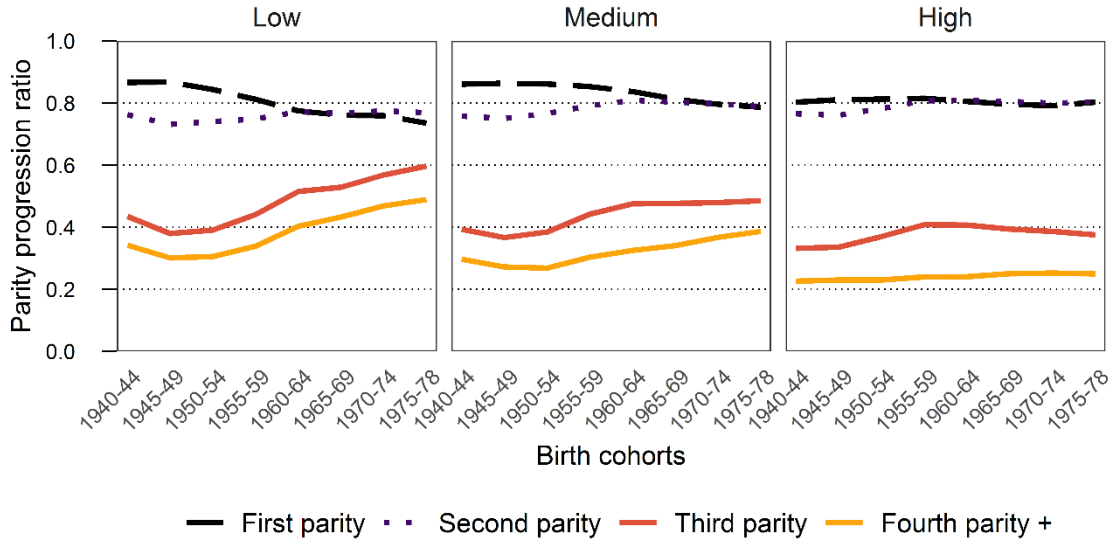
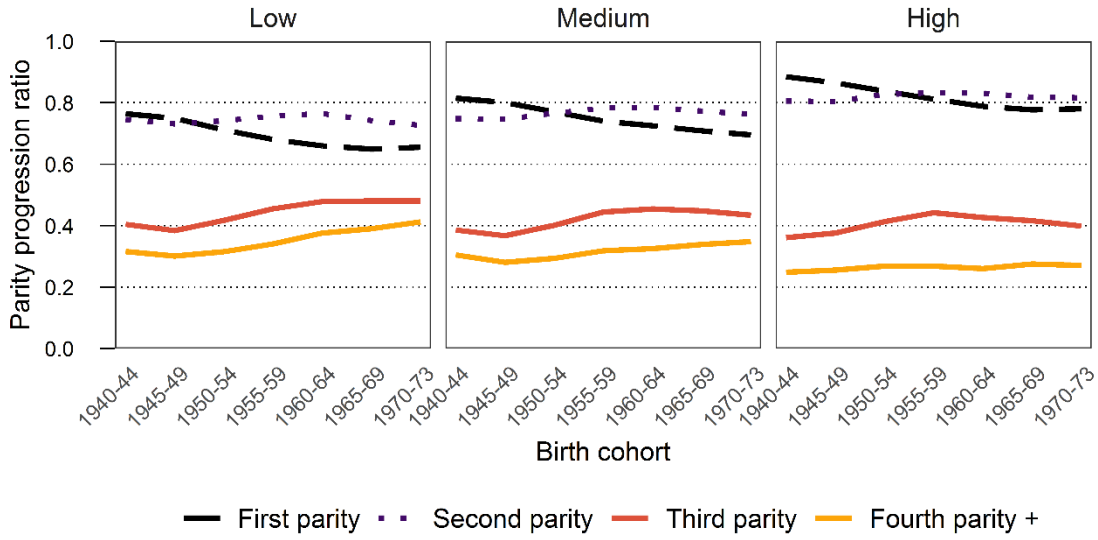


Figure 3. Parity progression ratios at age 40 by education and cohort for men born in Finland between 1940 and 1978.



Educational Differences in Parity-Specific Fertility

The introductory analyses suggest that in the youngest study cohorts, new educational differentials in parity-specific patterns have emerged. We now turn to the PPRs that provide a clearer and more detailed view of the parity-specific fertility trends among women and men at different levels of education. Figure 2 shows PPRs by educational level in Finland for women and Figure 3 for men. The increase in lifetime childlessness across cohorts is seen in the progression to parity 1 that declines in all groups defined by gender and education, except for highly educated women. In the most recent cohorts, levels of men and women's ultimate

childlessness are both highest among those with the lowest level of education. Progression to second parity shows notable stability across recent male and female cohorts, and only small educational differences.

At the same time, there are increases across recent cohorts among low- and medium-educated women and men in progression to third and fourth (or subsequent) parities. In the youngest female and male cohorts, progression to third and fourth parity is consistently and inversely associated with educational level.

Taken together, these trends mean that the childbearing patterns of lower educated men and women show strengthening polarization into lifetime childlessness and parities three, four, and higher. This parity polarization is clearest among women, and is observed among men with no education beyond the basic level; however, it is also noticeable among women and men with secondary level education, although partly in earlier cohorts.

For highly educated women and men in Finland, the PPR trends suggest a very different path. Childlessness among highly educated women shows no increase across cohorts. Of highly educated women, around 80% had a first child, and around 80% further proceeded to have a second child, and this pattern remains unchanged across the study cohorts. Proportions of those who proceeded to third and fourth parities are significantly lower compared to women with lower levels of education, and show slight declines (parity 3) or stability at comparably low levels (parity 4+). The patterns are very similar for highly educated men, the only difference being that childlessness levels for highly educated men increased across cohorts, although at higher levels than among low- and medium-educated men.

All in all, the largest gender differences are seen in the educational gradients in ultimate childlessness. For the youngest cohorts, the educational gradient in childlessness is now negative for both men and women, but the differences are still much larger for men. Men's levels of ultimate childlessness strongly increased up until the early 1960s birth cohorts at all education levels. In the most recent cohorts, the trend differs: the increase for highly educated men has levelled off, while childlessness among men with secondary education has continued to rise, with the youngest cohort reaching 31% (Figure S1). More than one third (35%) of the lowest educated men in the two most recent cohorts has remained childless. The trend towards parity polarization, where this increase in childlessness is

combined with increased entry into higher parities, is evident for basic educated men, and a weaker but salient trend exists for medium-educated men.

To summarize the parity-progression trends in the Finnish recent cohorts, highly educated women and men are now more likely to become parents than their low-or medium-educated peers. In the transition to second birth, stability across cohorts and lack of educational differences is notable. Across all educational levels and cohorts, women and men who had one child are almost equally likely to have a second child, with the exception of a small decline among low-educated men. However, especially in recent birth cohorts, low- and medium-educated men and women are more likely to proceed to third and higher parities, while the highly educated more often stop childbearing at parity two. How educational differences in the total number of children born by age 40 (women) and 45 (men) in Finland developed across cohorts is seen clearly in the relative parity distributions (Figures S6 for women and S7 for men). Among women, an inverse association between education level and the proportion of mothers of two children emerges across cohorts. Around 40% of highly educated women ultimately had two children, and this proportion shows no decline. Among medium-educated women, the proportion has declined to below one third, and among low educated women to one fourth. Among men, a similar pattern is observed in earlier study cohorts but has strengthened over time, resulting in very similar differences in the recent male and female cohorts. Note that among low educated men, ultimate childlessness is much more common than having two children, while among secondary educated men these two outcomes are equally likely. This is in strong contrast to highly educated men, who have much more often become fathers to two children than remained childless.

Despite stability in educational differences in CTF, Finnish fertility patterns have substantially diverged across cohorts, showing both divergence between tertiary educated and non-tertiary educated segments, as well as strengthening parity polarization within the non-tertiary educated. Low- and medium-educated men and women in recent cohorts have increasingly had no children, or proceeded to third or higher parities, whereas highly educated women and men more often reach but stop at parity two.

Figure 4. Parity progression ratios at age 40 by education and cohort for women born in Sweden between 1940 and 1978.

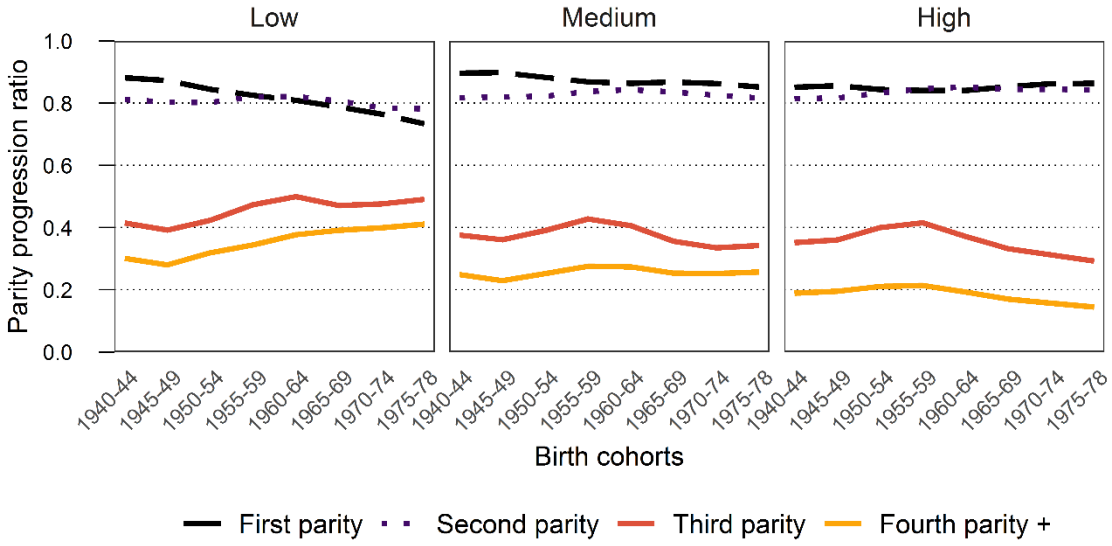
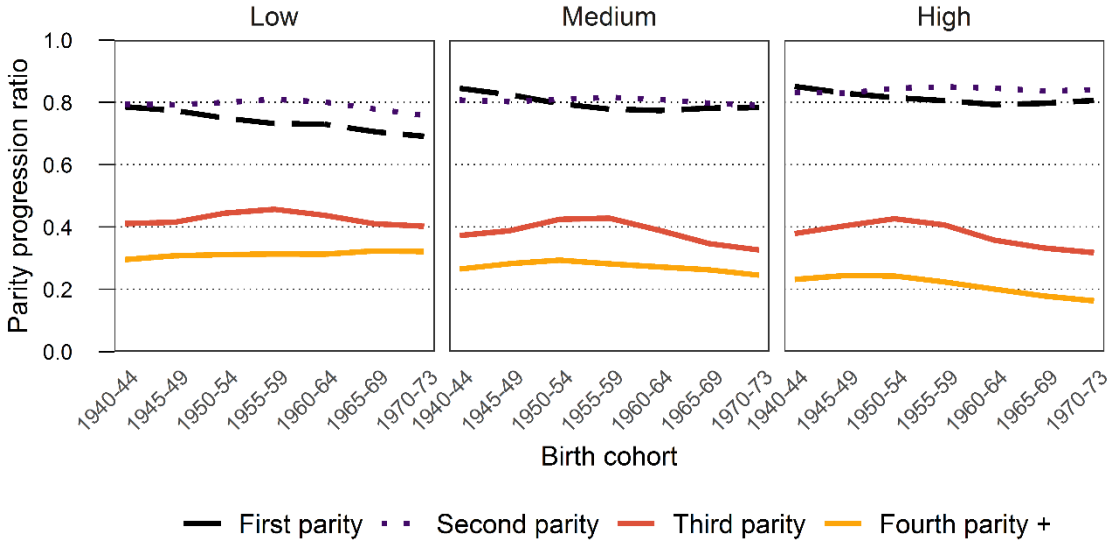


Figure 5. Parity progression ratios at age 45 by education and cohort for men born in Sweden between 1940 and 1978.

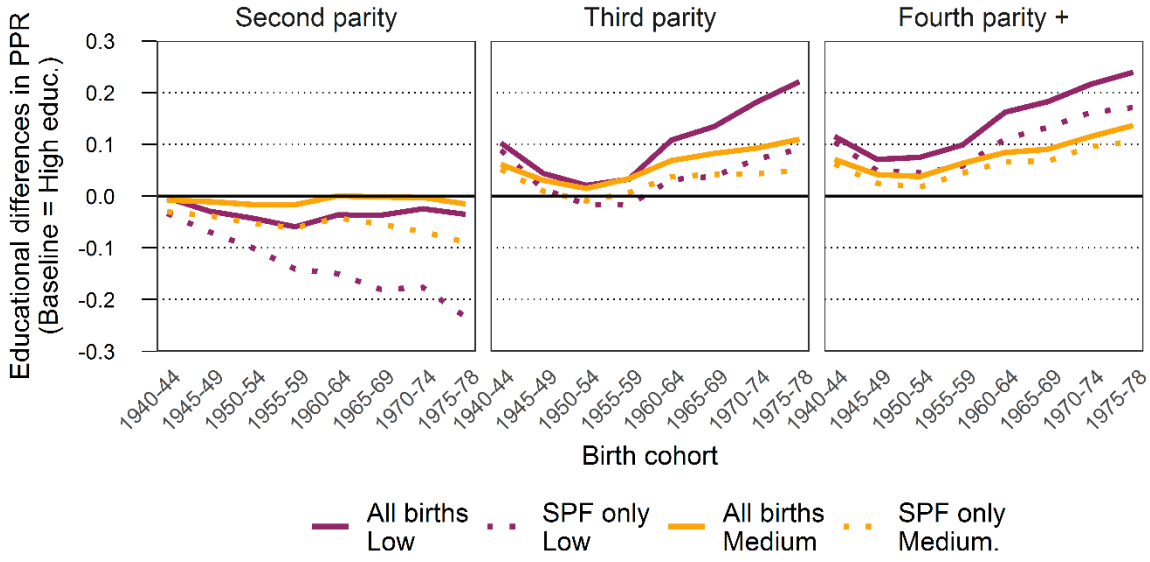


To see whether this development is specific to Finland or if it may represent a more general Nordic pattern, we present PPRs for the Swedish population. Basic educated women in Sweden (Figure 4) follow the parity polarization pattern found in Finland. Lower educated men also (Figure 5) show strong recent increases in ultimate childlessness, but among medium- and highly educated women and men, previous slight increases in childlessness have levelled off. Moreover, there is a slight decline in third and fourth births for the secondary and tertiary educated across both Swedish male and female cohorts. Parity polarization is not as prominent in Sweden compared to Finland, and is driven by stronger

declines in higher parity transitions among tertiary educated rather than increases among the non-tertiary educated. The result for the relative parity distributions for Sweden highlights these differences (Figure S8 for women and S9 for men). They show that, while decreasing proportions of lower educated men and women had exactly two children, increasing proportions of their medium- and highly educated peers have done so. In the youngest cohorts, this share is as high as half among highly educated women.

To summarize, parity specific analysis reveals transitions to second births as a constant across cohorts, gender, and educational level for the two countries studied. Among the trends predicted, salient parity polarization among the low- and medium-educated was evident in Finland but weaker and more limited (to the lowest educated) in Sweden.

Figure 6. Differences in parity progression ratios across educational levels (baseline = tertiary education), by cohort. All births and SPF only for women born in Finland between 1940 and 1978.



Multiple-partner Fertility and Educational Differences in Parity Progression

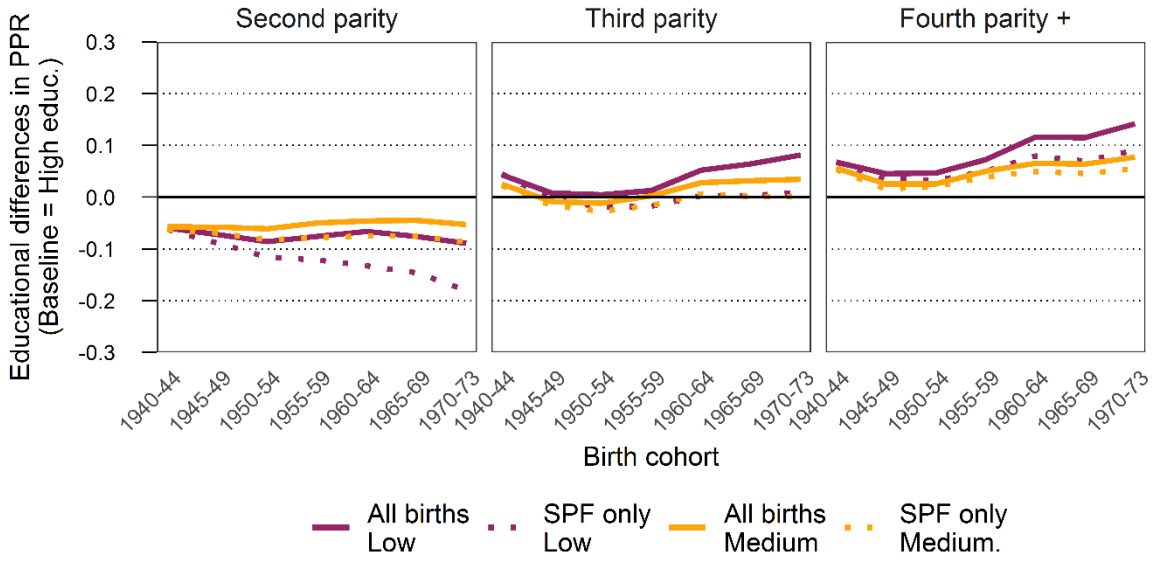
Thus far, we have described developments in parity-specific fertility regardless of the number of reproductive partners. However, what are the trends in educational differences in parity-specific fertility when only considering births to the first reproductive partner? The purple lines in Figure 6 below show the difference between the PPR of the highly educated (baseline group) and the PPR of the lower-educated Finnish women. The yellow lines show the difference between the PPR of the highly educated and the PPR of the medium educated.

Solid lines show educational differences in PPR derived from all births: that is, when childbearing with all reproductive partners (SPF and MPF) is included. The dotted lines merely count SPF, meaning that when the PPRs and their educational differences are calculated, only births to the first reproductive partner are considered.

For second parities, the differences are just slightly below baseline, indicating that in all cohorts, the low and medium educated were just slightly less prone to proceed to have second children as compared to the highly educated. However, the initial small difference in PPR2 between the highly and medium/low educated increases when comparing births to only the first reproductive partner. Thus, MPF notably contributes to low- and medium-educated women's progression to second births. The contribution of MPF (indicated by the gap between the solid and dashed line) increases across cohorts. In the oldest cohort, the PPR2 of the basic educated is just slightly lower than that of the highly educated if only births to first reproductive partners are counted. Among the youngest cohort the difference is about 0.2. Hence, the stability across cohorts in total PPR2 between educational groups masks a substantive change—the composition of second birth progression is increasingly made up of MPF among lower educated women. A similar, but somewhat weaker trend is seen among the medium educated. Whereas differences were very small for old cohorts, for the medium educated the PPR2 of younger cohorts is 0.1 lower than among highly educated women when considering only births to first reproductive partners.

For progression to third births, the educational differences are reversed. PPR differences are now above the baseline, particularly for the more recent cohorts, indicating that compared to highly educated women, basic- and medium-educated women more often proceeded to third birth. This difference notably increases across the cohorts. The increased PPR differences between the low- and highly educated are to a large degree composed of increases in births to higher-order reproductive partners among low-educated women. The contribution of MPF increases across cohorts. In the youngest cohorts of basic educated, PPR3 is 0.1 instead of 0.2 greater than for the highly educated, if only births to first reproductive partners are compared. For the medium educated, PPR3 is 0.05 rather than 0.1 greater than the tertiary educated when comparing births to first reproductive partners. The pattern for PPR to four or more births is similar, although the contribution of MPF does not increase as much as for second and third parities across cohorts.

Figure 7. Differences in parity progression ratios across educational levels (baseline = tertiary education), by cohort. All births and SPF only for men born in Finland between 1940 and 1978.



The pattern for Finnish men (Figure 7) follows the overall trends observed for Finnish women, but the educational differences in PPR are not as strong across all parities. Among Finnish men, the MPF contributes most to parity progression among the low educated, and the difference between the low- and highly educated increases across cohorts. The influence of MPF is somewhat stronger for PPR3 and PPR4 for both men and women in Sweden (Figure 8 and Figure 9). However, overall the trends in differences between educational groups and its relationship to MPF found among the Finnish population are remarkably similar in Sweden. For completion, parity progression ratios for births to first reproductive partners are reported in the supplementary material (Figures S10–S13).

Figure 8. Differences in parity progression ratios across educational levels (baseline = tertiary education), by cohort. All births and SPF only for women born in Sweden between 1940 and 1978.

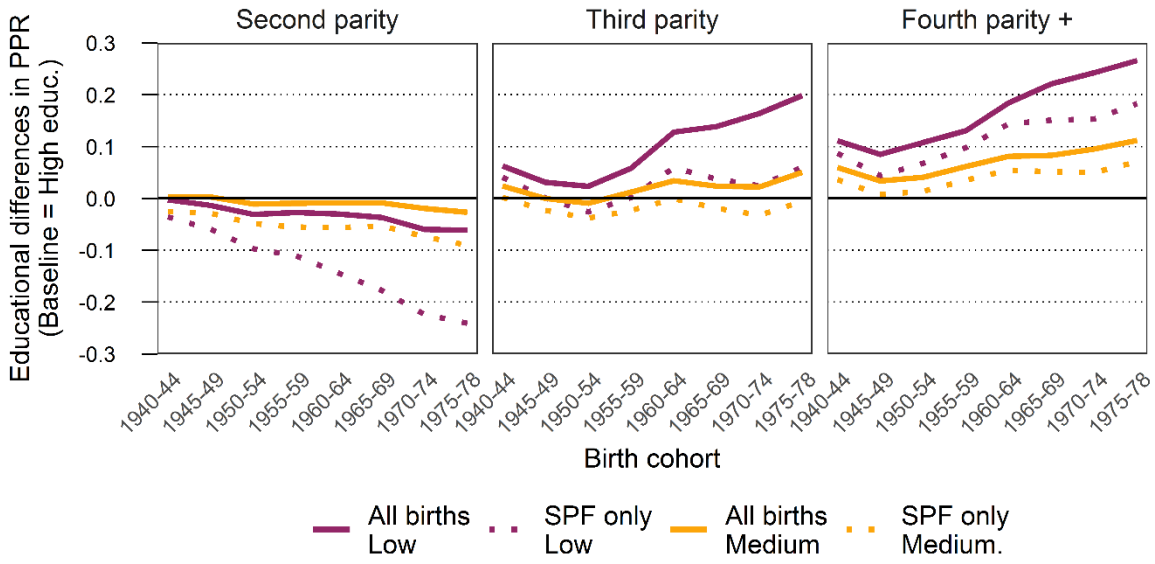
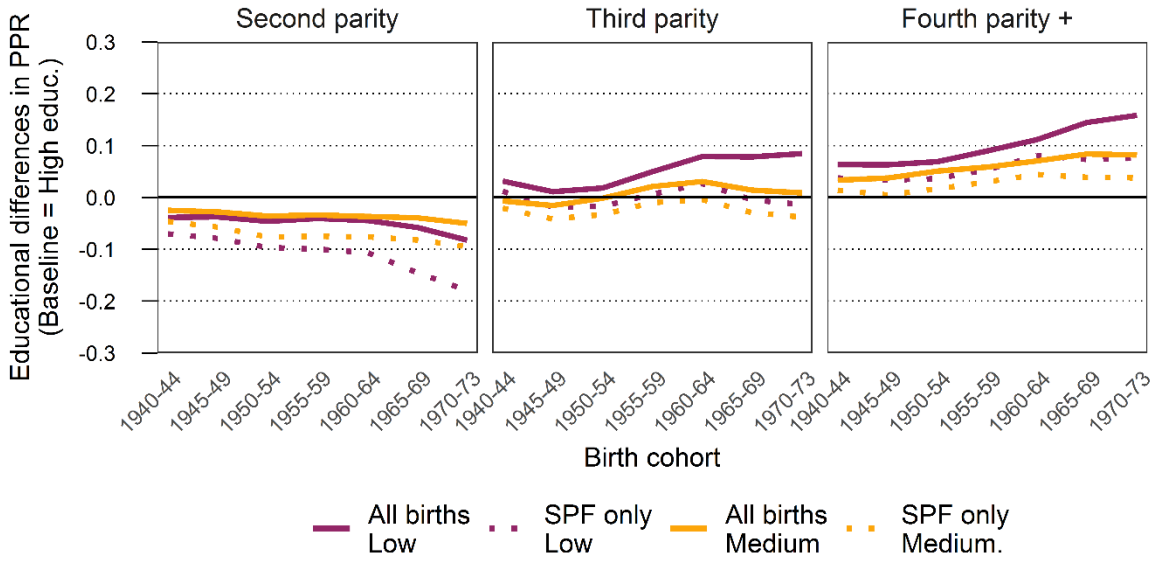


Figure 9. Differences in parity progression ratios across educational levels (baseline = tertiary education). All births and SPF only for men born in Sweden between 1940 and 1978.



Discussion

This study revisited trends in socioeconomic fertility differentials. In Nordic countries, the current narrative is that a positive association between men's education and fertility persists across cohorts, while for women the initially negative associations show convergences.

Educational gradients in women's lifetime childlessness have turned from positive to negative: that is, they are increasingly similar to those found among men (Jalovaara et al. 2018). In the 'new' fertility regime then, a higher socioeconomic status is associated with higher fertility for women and men (Kolk 2019). This study argues that this narrative should be complemented with trends in parity-specific fertility and the role of MPF to improve our understanding of changes in socioeconomic fertility differentials.

This study focuses on two Nordic countries—Finland and Sweden—and extends previous research by analysing, not only CTF and childlessness levels, but also parity-specific differences and trends, and by estimating the significance of MPF for these. This more fine-grained analysis reveals significant and partly strengthening differences in fertility patterns both between and within educational segments, suggesting that educational differences in Nordic fertility patterns have persisted and strengthened and that MPF plays a role in the disparities.

Trends in CTF suggest that the differences between educational segments are fairly stable and are mostly small. However, parity-specific analyses show strong and strengthening differences between and within educational groups that were masked by the apparent stability in CTF. Compared to their highly educated peers, the fertility patterns of women and men with lower education are more heterogeneous as regards the numbers of children they have, and show clear and partly strengthening polarization to lifetime childlessness on one hand and more frequent progression to third and subsequent parities on the other. Among lower-educated women and men, the proportions of those who ultimately had two children declined towards younger cohorts. Progression to third and higher order births became more likely among men and women without tertiary education.

Among highly educated men and women, childbearing patterns are more uniform and more often lead to the birth of precisely two children. Levels of ultimate childlessness for highly educated men are much lower than for men with less education, and no increases are observed for the most recent cohorts. Among highly educated women, childlessness levels have remained stable, and have even recently declined. While the childbearing histories of highly educated men and women show persistence in reaching and stopping at parity two, the pattern is even stronger in Sweden, and has strengthened between 1950s and 1970s cohorts.

These patterns are in line with Hypothesis 1. Parity polarization is strengthening among lower educated towards recent cohorts, while no such trend is observed among highly educated men and women.

Although the trends in the two countries are fairly similar, some differences emerge. The most prominent difference is that parity polarization is stronger in Finland than in Sweden. The increases in higher parity births are more notable in Finland. But, even more importantly, parity polarization in Sweden is limited to the lowest educational segment, whereas in Finland it also concerns the large segments of medium-educated women and men. With educational expansion, the group of the lowest educated has become smaller and increasingly marginalized. However, even in the youngest, most highly educated cohorts, the low and medium educated in total constitute 40% of women and 60% of men in Finland and Sweden. Hence, the diverging trends in childbearing between the tertiary and non-tertiary educated shown in this study represent socioeconomic disparities in fertility between large groups and also influence fertility at the population level.

The second key finding is that educational differences in fertility are strongly linked to MPF. Without counting births with higher-order reproductive partners, the parity progression to second births is substantially smaller among the non-tertiary educated compared to the tertiary educated. Respectively, the more frequent progressions to third and subsequent parities found among non-tertiary educated are substantially fewer. Supporting Hypothesis 2, the contribution of MPF to educational differences in progression to second and subsequent parities increased across cohorts. The present findings highlight the importance of changing partnership dynamics in understanding socioeconomic disparities in fertility levels and trends (Thomson et al. 2012). A large body of literature has documented how union instability and family complexity have increased disproportionately among less affluent groups across cohorts (McLanahan 2004). While stable childbearing unions are generally preferred across all social strata, such life courses are becoming increasingly selective of well-off couples (McLanahan & Percheski 2008; Ruggles 2015), reflected in the MPF socioeconomic differentials. To understand how socioeconomic fertility differentials emerge, it is useful to illuminate the influence of births to first and higher-order reproductive partners.

In conclusion, the educational differences and trends in family formation dynamics can be summarized through the idea of dual polarization. The first layer of dual polarization is socioeconomic, where the trends among higher-educated segments differ—and even

increasingly diverge—from trends among men and women with lower educational levels. The second layer is internal polarization within the lower educational segments that show stronger and strengthening parity polarization of childlessness on one hand, and higher (3+) parities on the other. The trends in dual polarization are observed for both men and women, and one could argue that they contribute to the educational differences in women's and men's fertility becoming increasingly similar.

One key mechanism in the parity polarization among men and women with lower levels of education is partnership dynamics. Previous research suggests that lifetime childlessness is strongly linked to never partnering and cohabitation instability (Keizer et al. 2008; Jalovaara and Fasang 2017). Our analysis shows that increased entry into higher parities among the lower educated are often linked to childbearing with several partners. It may also be the case that Nordic support to gender-equality and work-family reconciliation in particular helps highly educated men and women to follow the norm of having two or more children. An unforeseen development is that both obstacles to family formation (reflected in lifetime childlessness) and obstacles to family stability (reflected in MPF) are increasingly concentrated among women and men with lower education. MPF presents policy challenges relating to the well-being of children of lower educated parents. Parents with a weaker labour market position are particularly likely to have children with different partners, which potentially leads to less parental involvement and parents' difficulties in financially supporting all their children. This implies an accumulation of disadvantages. That it occurs in Nordic welfare societies where social inequality is an important goal calls for attention from researchers as well as policymakers.

The findings on dual polarization in Nordic childbearing patterns warrants caution in deducing the theoretical fertility drivers from completed cohort fertility. The turn towards a more positive educational fertility gradient for women has been interpreted as the result of the Nordic countries' position as a forerunner of institutionally supported gender equality, which paved the way for a positive link between economic success and on fertility for both men and women. The present findings support the idea of gender convergence, but are in conflict with the prediction of a straightforward positive association between economic resources and fertility. High education appears to be positively related to entry into parenthood and ultimately having two children, but not a greater quantity of children.

In conclusion, the study results highlight the importance of parity-specific patterns and MPF in correctly describing and understanding socioeconomic fertility differentials.

Cohort analysis of fertility trends can make good use of both parity-specific and partner-specific analyses. This study demonstrates the feasibility of this approach by contributing new insights to the educational fertility differences for men and women in two Nordic countries.

Several realistic extensions of this project enable future research. While the present study adopted a similar contexts-design to validate trends, subsequent research may explore a comparative perspective that draws on a larger number of countries of contrasting fertility regimes and institutional frameworks.

Acknowledgements

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Supplementary materials

Table S1. Educational levels (%) birth cohorts of 1940–1978 for men and women in Finland and Sweden.

	1940–44	1945–49	1950–54	1955–59	1960–64	1965–69	1970–74/73[1]	1975–78
Finland – Women								
Low	48	38	26	16	9	8	6	5
Medium	30	36	42	43	44	39	36	35
High	22	28	32	41	47	53	58	60
Finland – Men								
Low	48	40	30	22	16	15	14	
Medium	27	34	42	47	51	49	47	
High	25	26	28	31	33	36	39	
Sweden – Women								
Low	33	23	16	12	8	6	5	5
Medium	42	46	48	50	51	50	42	36
High	25	31	36	39	41	44	53	59
Sweden – Men								
Low	37	29	25	20	15	10	9	
Medium	40	44	45	50	54	55	31	
High	23	27	30	30	31	35	39	

[1]1970–1974 (women), 1970–1973 (men).

Table S2. MPF by parity and education for Finnish men and women born between 1940 and 1978.

	Mothers		Fathers	
	Cohort			
	1940–44	1975–78	1940–44	1970–73
Parents with second births:				
Second birth different partner				
Basic	7	31	5	17
Secondary	6	14	5	9
Tertiary	3	5	4	4
All	6	9	5	8
Parents with third births, first two same partner:				
Third birth different partner				
Basic	13	50	13	36
Secondary	12	30	15	23
Tertiary	7	13	14	13
All	11	22	14	21
Parents with fourth births, first three same partner:				
Fourth birth different partner				
Basic	18	59	21	48
Secondary	17	39	24	35
Tertiary	11	19	24	22
All	16	32	23	33

Table S3. MPF by parity and education for Swedish men and women born between 1940 and 1978.

	Mothers		Fathers	
	Cohort			
	1940–44	1975–78	1940–44	1970–73
Parents with second births:				
Second birth different partner				
Basic	10	28	11	17
Secondary	9	12	10	10
Tertiary	6	4	7	4
All	8	8	10	8
Parents with third births, first two same partner:				
Third birth different partner				
Basic	20	52	29	45
Secondary	21	34	28	33
Tertiary	12	14	22	15
All	19	24	27	27
Parents with fourth births, first three same partner:				
Fourth birth different partner				
Basic	32	65	49	66
Secondary	35	51	49	56
Tertiary	22	30	42	35
All	31	45	48	41

Figure S1. Births to second or higher order reproductive partners by education and cohort for women and men born in Finland between 1940 and 1978.

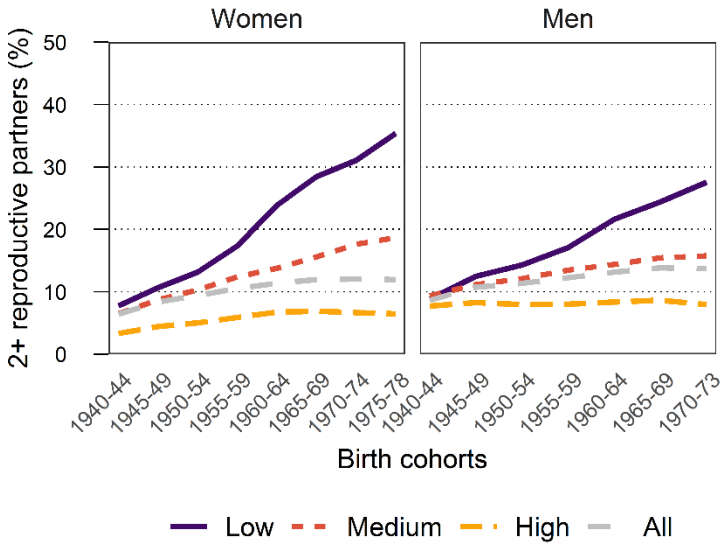


Figure S2. Births to second or higher order reproductive partners by education and cohort for women and men born in Sweden between 1940 and 1978.

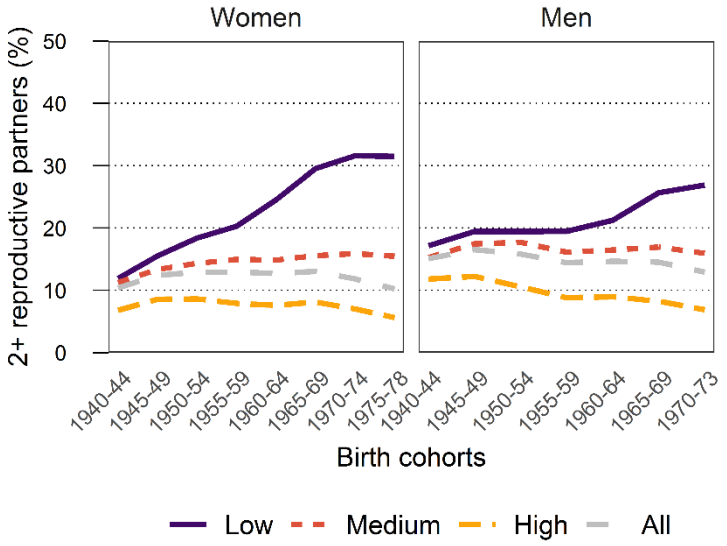


Figure S3. Cohort total fertility, childlessness (%), and cohort total fertility among parents at age 45 by education and cohort for men born in Finland between 1940 and 1978.

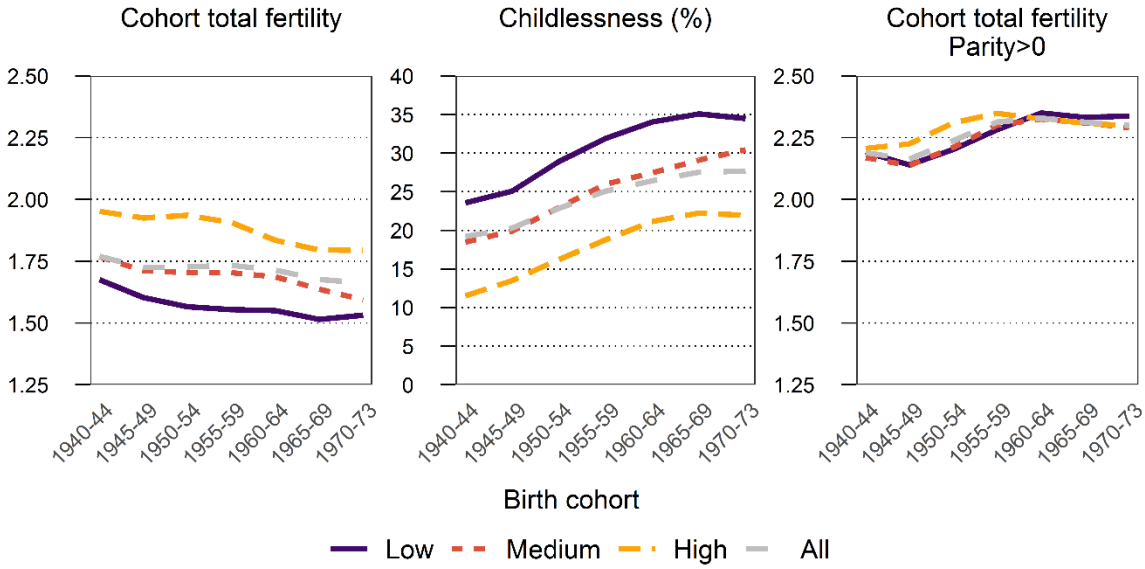


Figure S4. Cohort total fertility, childlessness (%), and cohort total fertility among parents at age 40 by education and cohort for women born in Sweden between 1940 and 1978.

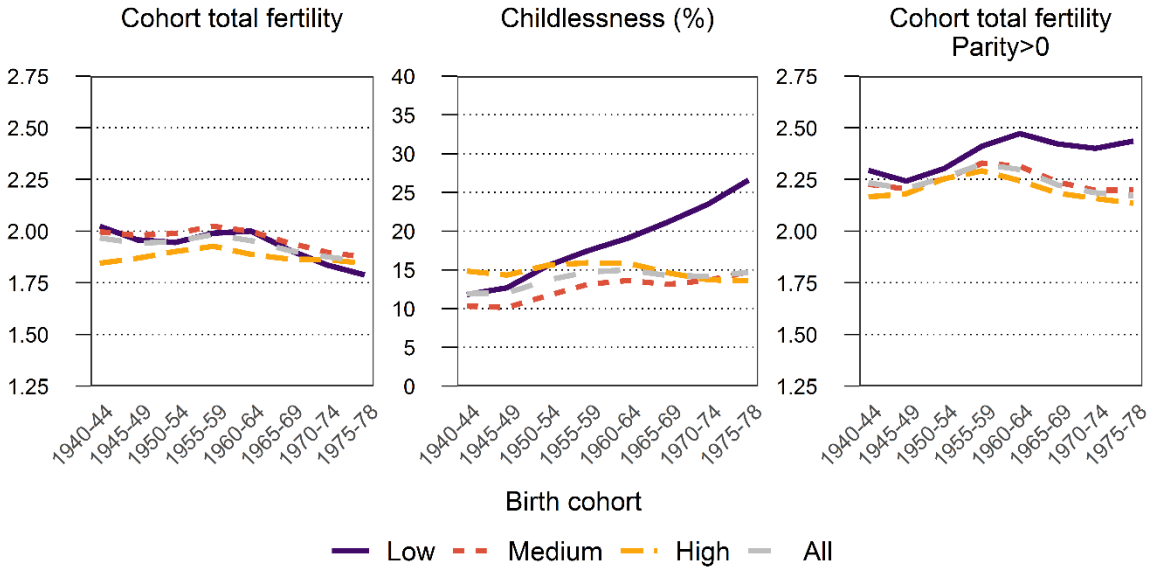


Figure S5. Cohort total fertility, childlessness (%), and cohort total fertility among parents at age 45 by education and cohort for men born in Sweden between 1940 and 1978.

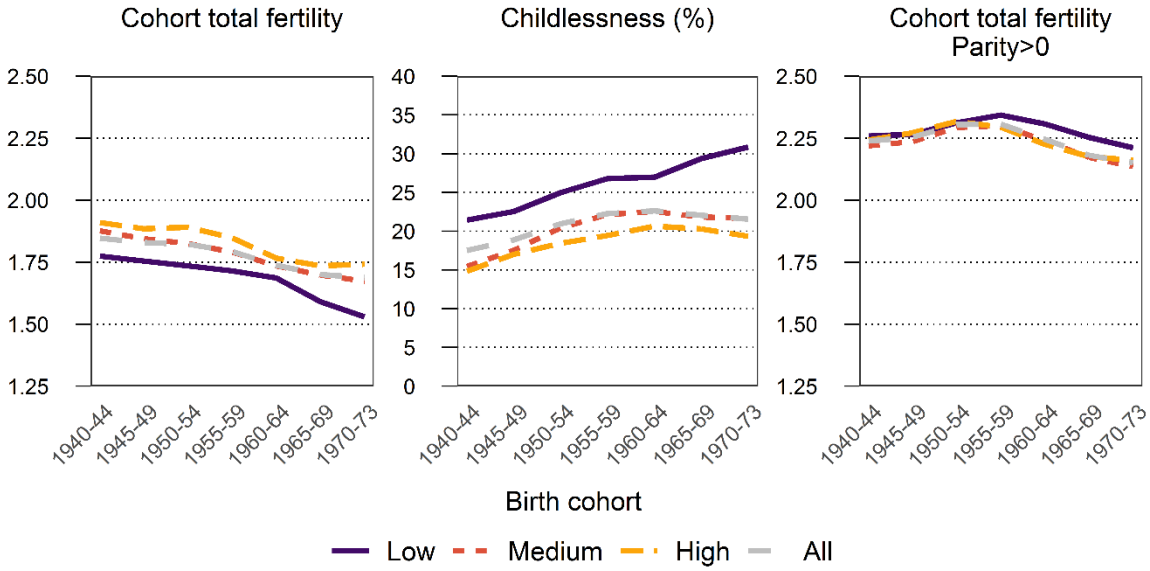


Figure S6. Parity distributions (%) at age 40 by education and cohort for women born in Finland between 1940 and 1978.

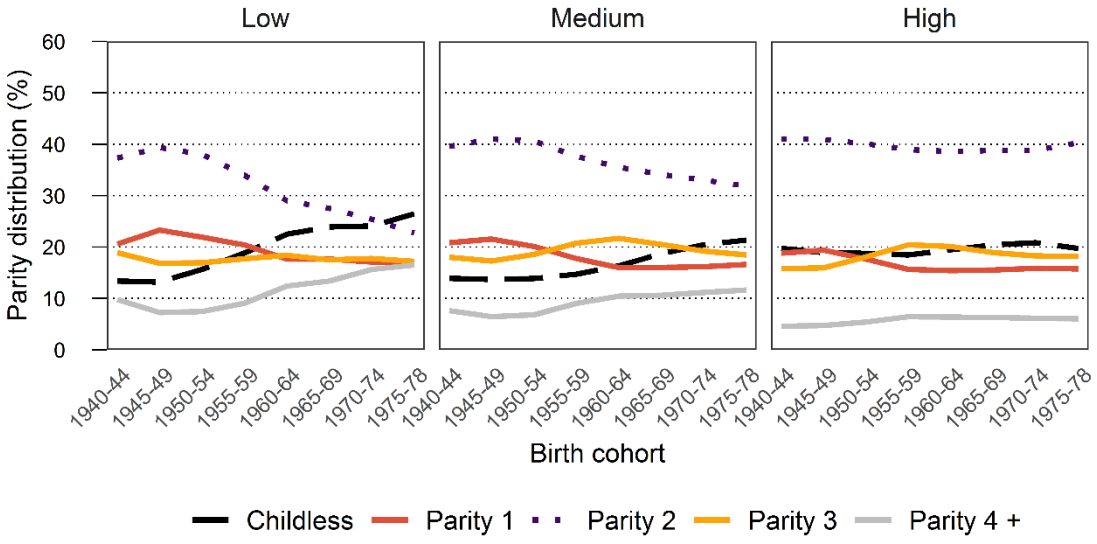


Figure S7. Parity distributions (%) at age 45 by education and cohort for men born in Finland between 1940 and 1978.

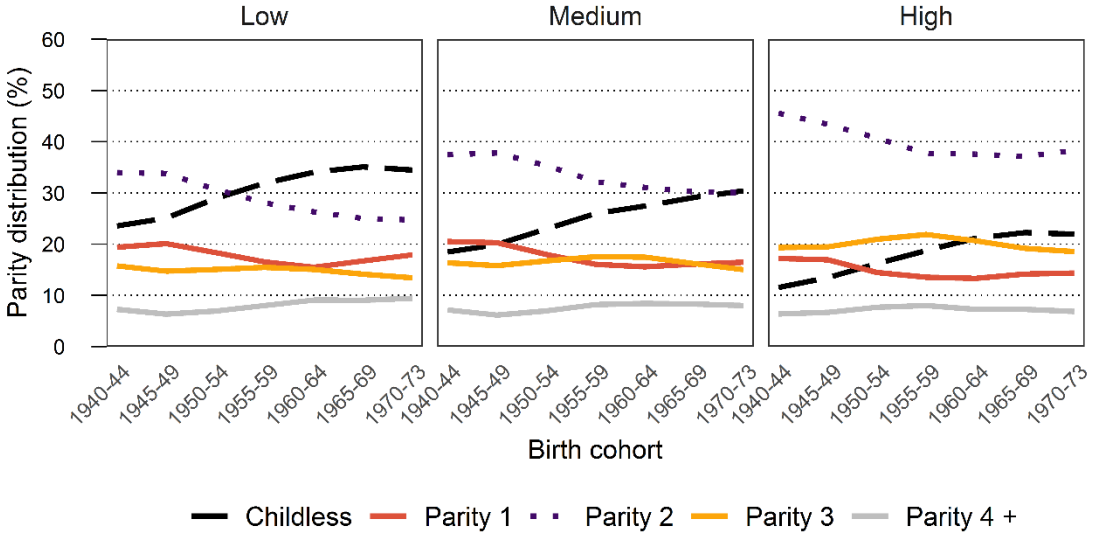


Figure S8. Parity distributions (%) at age 40 by education and cohort for women born in Sweden between 1940 and 1978.

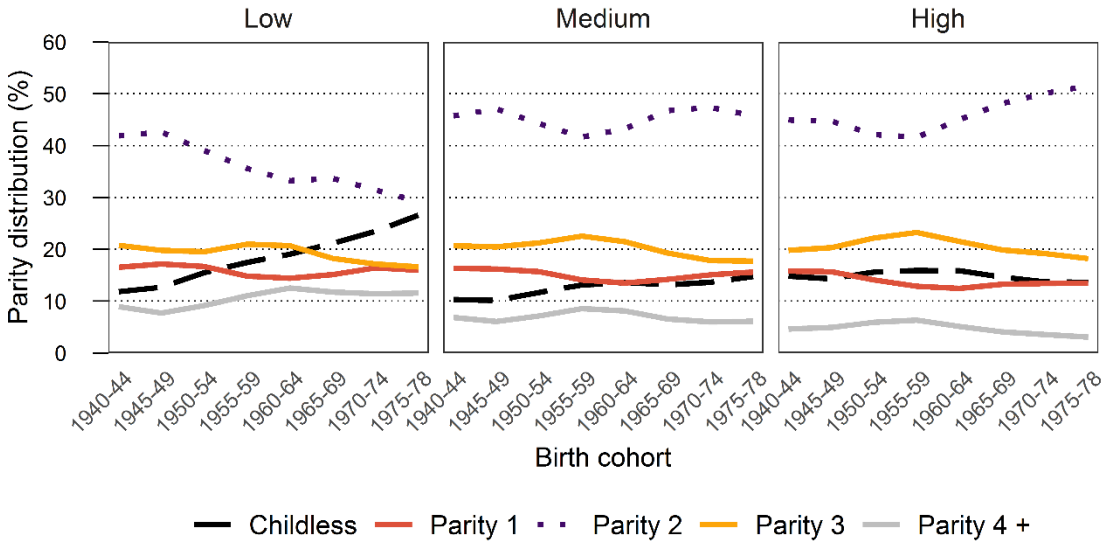


Figure S9. Parity distributions (%) at age 45 by education and cohort for men born in Sweden between 1940 and 1978.

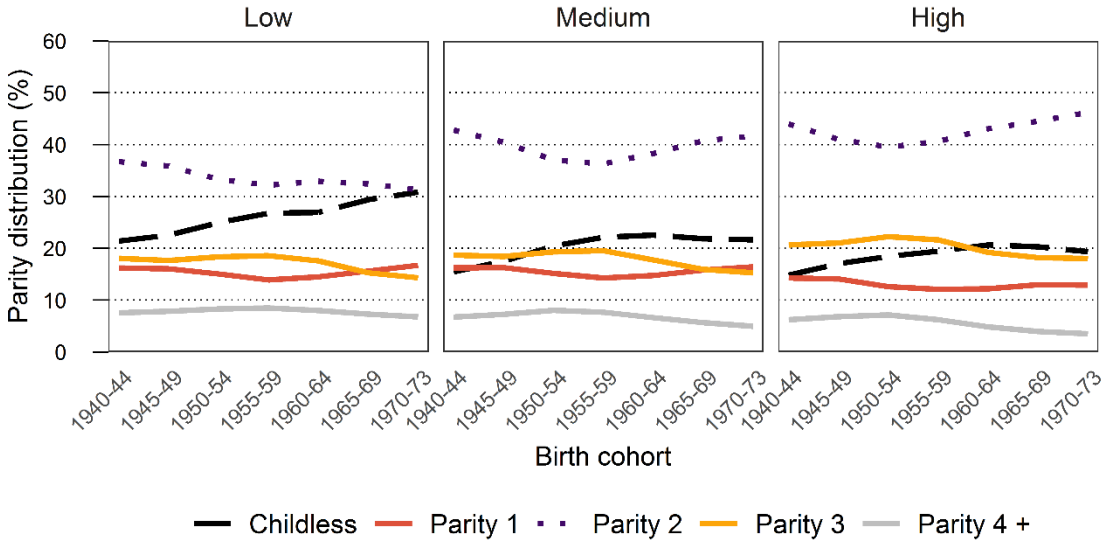


Figure S10. Parity progression ratios, births to first reproductive partner, by education and cohort for women born in Finland between 1940 and 1978.

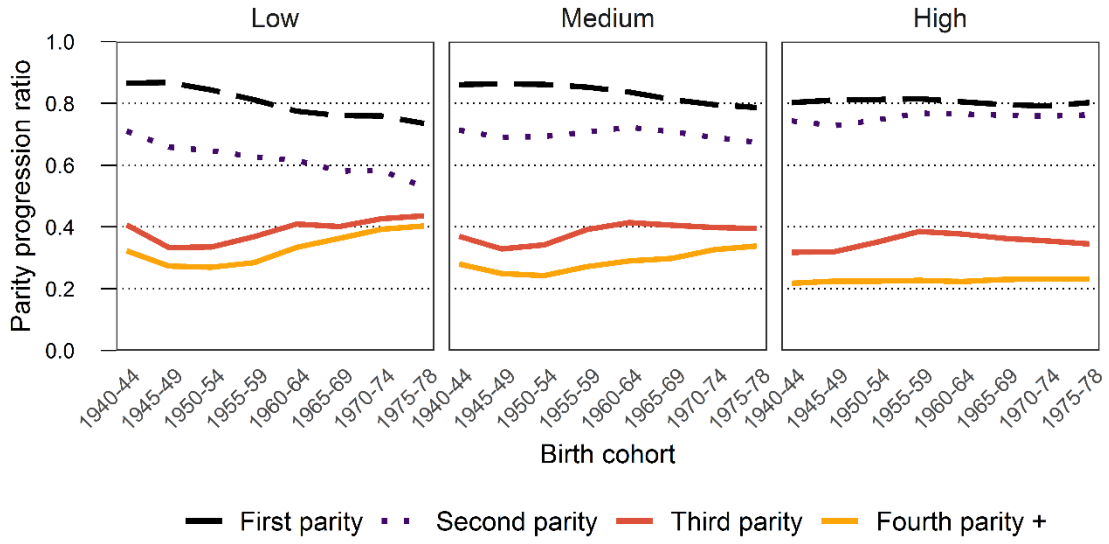


Figure S11. Parity progression ratios, births to first reproductive partner, by education and cohort for men born in Finland between 1940 and 1978.

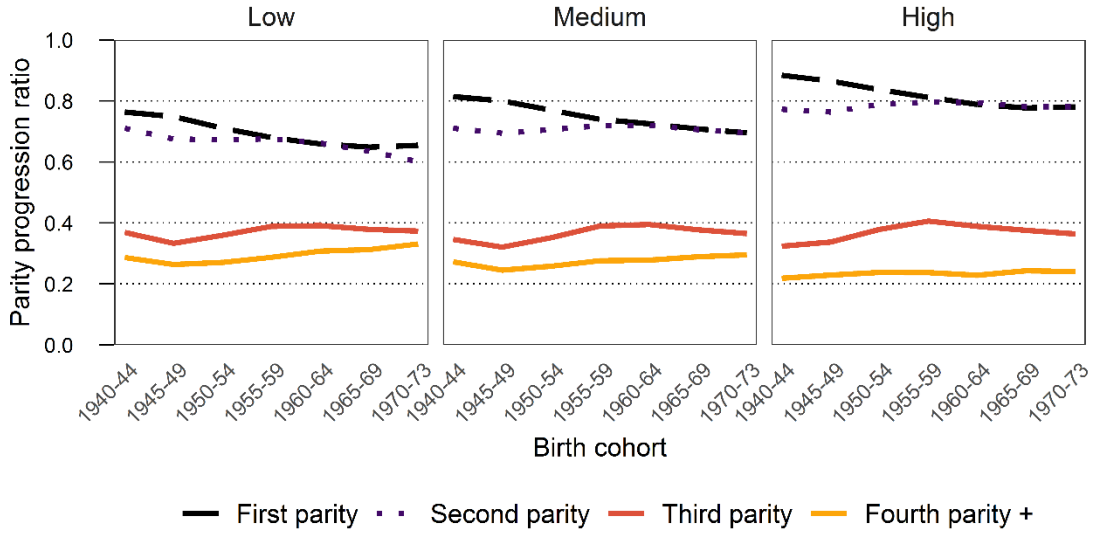


Figure S12. Parity progression ratios, births to first reproductive partner, by education and cohort for women born in Sweden between 1940 and 1978.

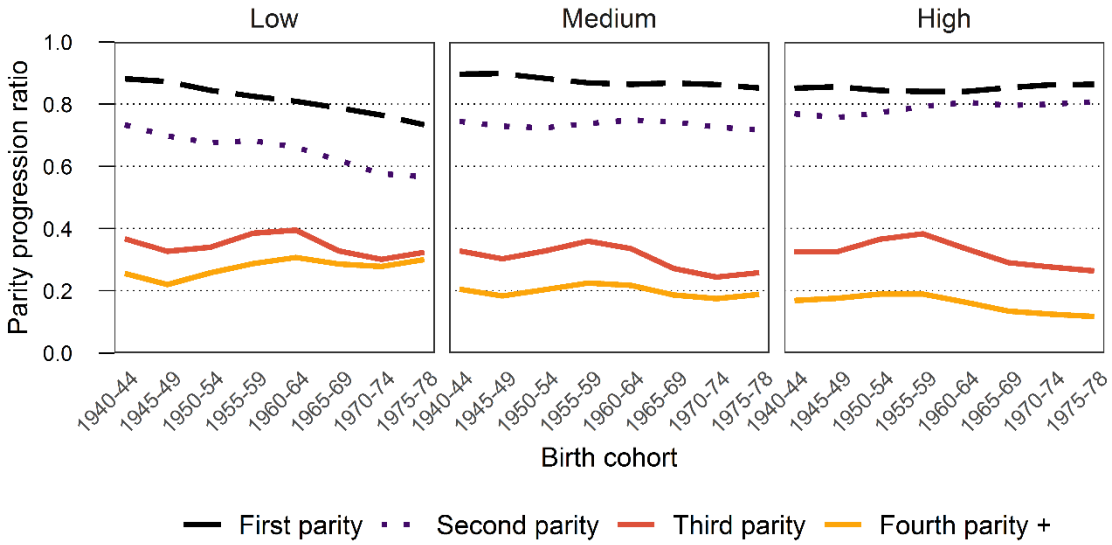
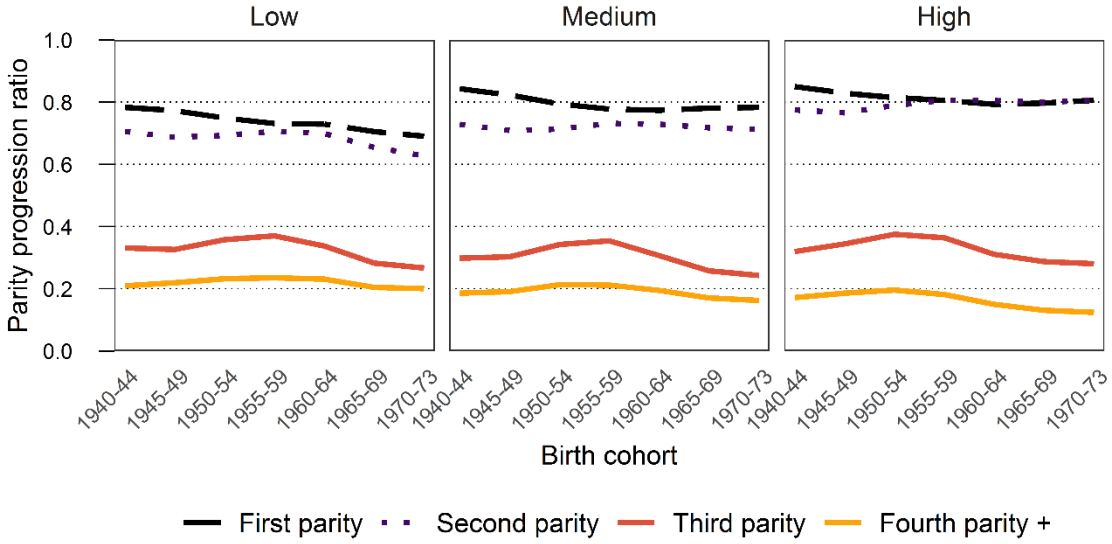


Figure S13. Parity progression ratios, births to first reproductive partner, by education and cohort for men born in Sweden between 1940 and 1978.



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