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Research Note

Childlessness trends at different ages by educational attainment for men and women in Finland: A research note

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Research on childlessness by educational attainment typically focuses on lifetime childlessness at age 40 or 45, with less known about younger ages. This study examines trends in childlessness by age and education for men and women in Finland from 1987 to 2022, using total population register data. We focus on childlessness at ages 30, 35, 40, and 45. The results show that childlessness has increased at most ages, with acceleration in the past decade. At ages 40 and 45, the association between education and childlessness is negative for men—men with lower education are more often childless—while among women, the association has reversed from positive to negative in recent years. At age 30, childlessness is higher among the highly educated, reflecting later entry into parenthood. At age 35, childlessness has risen across all groups, notably including tertiary-educated men and women. These trends suggest that the increase in lifetime childlessness in Finland is likely to continue and become more widespread.

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Keywords: childlessness; fertility; education; age; gender; Finland

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Background

Until 2010, fertility rates in the Nordic countries remained relatively high compared with those in much of Europe. This has been attributed mainly to the generous support for families and policies that promote gender equality in work and family life in these countries (Mills et al. 2011). Since 2010, fertility has fallen markedly in all Nordic countries, most notably in Finland, suggesting a potential shift in the Nordic fertility regime. Between 2010 and 2023, the period total fertility rate (TFR) in Finland fell from 1.87 to 1.26 (Statistics Finland 2024). At this level, the Finnish TFR is now by far the lowest among the Nordic countries and significantly below the European average of 1.46 (Eurostat 2024). The decline in fertility can be observed at all parities, although it has been driven primarily by decreasing first-birth rates (Hellstrand et al. 2021). Delayed entry into parenthood means that higher proportions of young adults are childless at each age. Individuals in their early 30s are still in their prime reproductive years, so childlessness at this stage of life largely signals postponement of parenthood to a somewhat later age. At older ages, however, it becomes a stronger indicator of lifetime childlessness.

Childlessness, defined here as not having had biological children by a certain age, can result from a mix of voluntary and involuntary factors. These

factors may include situational, psychological, social, and biological influences, whose significance can shift over the life course. First, for some people, remaining childless is the result of a deliberate choice. In Finland, surveys have indicated a slight increase from the 2000s to the 2010s in the share of people who do not want children. Since then, the figure has remained stable at around 10 per cent or slightly above, with no discernible differences between men and women (Miettinen 2015; Sorsa et al. 2023).

Second, childlessness may be a consequence of biological fecundity issues or other health problems. For example, polycystic ovary syndrome or endometriosis can occur in women at an early age (Bremer 2010; Shim and Laufer 2020), and delaying the onset of childbearing increases exposure to lifestyle factors (such as smoking, obesity, or sexually transmitted diseases [e.g. chlamydia]) and environmental toxins (Ramsay et al. 2023), which can affect fertility in both men and women (Homan et al. 2007; Schmidt et al. 2012).

Third, for the majority of those who do not become biological parents, childlessness is not the result of a single, firm decision made early in life or a consequence of health or fecundity issues. Rather, many individuals wish to have children but repeatedly make choices or face constraints that lead to a continuous postponement of parenthood (Berrington 2017). These decisions and constraints are often related to circumstances such as enrolment in education or lack of a suitable partner (Savelieva et al. 2023). In addition, social norms about the appropriate age to start a family are increasingly favouring later entry into parenthood (Lazzari et al. 2025), a trend reinforced by an increase in the proportion of young adults delaying childbearing to well beyond age 30.

As postponement of the first birth now often extends beyond age 30, this may increasingly result in lifelong childlessness, as the risk of involuntary childlessness rises. Women's fecundity declines with age, and it has been estimated that among nulliparous women, a significant decrease begins around age 30 (Schmidt et al. 2012; Rothman et al. 2013). Furthermore, after age 35, the likelihood of complications during pregnancy and adverse pregnancy and perinatal outcomes increases (Schmidt et al. 2012; Londero et al. 2019). For men, age-related fecundity decline is more subtle than for women (Rothman et al. 2013), but men tend to partner with women of similar age (being on average two to three years older than their female partners), so women's fecundity limitations strongly influence men's entry into parenthood. Fertility postponement may also affect completed fertility beyond the first child, as postponing first childbearing to an older age reduces the time available for parents to have additional children before the end of the reproductive period (Beaujouan et al. 2023).

Educational differences in fertility, including childlessness, are a core component of demographic knowledge, as they shed light on how and why populations change. They also provide information on social and economic barriers to family formation. In developed countries, the postponement of childbearing to a later age has occurred in parallel with the rapid expansion of higher education, wherein a growing proportion of young men and women have completed education at secondary and tertiary levels (Mills et al. 2011; Kreyenfeld and Konietzka 2017). Long prevalent theoretical frameworks have attributed shifting educational gradients and the postponement or foregoing of parenthood to broader value changes and increasing individualization (Lesthaeghe 2014) or to role incompatibility, particularly among women (Blossfeld and Huinink 1991). Nordic cohort fertility studies (Jalovaara et al. 2019, 2022) have shown a consistent inverse association between educational attainment and lifetime childlessness among men. For women, the association has reversed over time. In earlier cohorts (born in the 1940s and 1950s), highly educated women were more likely to remain childless, but in recent cohorts childlessness has been highest among women with low educational attainment and lowest among women with high educational attainment. This means that educational differences in lifetime childlessness have become similar for women and men. The fact that we observe an emerging positive association between education and entry into parenthood among women in recent cohorts in the Nordic countries has been interpreted as reflecting reduced opportunity costs of family formation among highly educated women as a result of strong institutional support for reconciling work and family life and also gender equality (Goldscheider et al. 2015). Higher education implies greater social and economic resources that promote family formation, not only for men but also for women (Jalovaara et al. 2019, 2022; Miettinen and Jalovaara 2020). However, as the recent fertility decline seems to be affecting all population groups, these associations may be changing.

This study provides a description of trends in childlessness at different ages by educational attainment in Finland. It examines the proportion childless at four age benchmarks (30, 35, 40, and 45) during the period between 1987 and 2022, focusing on

women and men born in Finland. On the one hand, diminishing educational differences in childlessness at age 30 might indicate that the 'postponement culture' has become more pervasive, now applying also to less educated individuals. On the other hand, educational differences at older ages may reveal growing disparities in family formation by individuals' socio-economic status.

Data

We use Finnish total population register data on individuals in the population in Finland in 1987–2022 and describe trends in childlessness (i.e. the proportion of women and men who remain childless up to ages 30, 35, 40, and 45).

We start by examining trends in childlessness at each age benchmark in the entire populations of women and men in Finland. We compare trends between the total populations of women and men and those born in Finland. In our data, the share of foreign-born individuals in Finland is 5–8 per cent among women and men, decreasing with age but increasing in more recent years (see Table S1, supplementary material for age 35). The analysis stratified by educational level focuses on individuals born in Finland, owing to incomplete information on educational and fertility histories among the foreign-born population regarding the period before they immigrated. Coverage of men's fertility histories is almost as complete as that of women. Only 2.1 per cent of children born to mothers in Finland have no father registered (authors' calculations based on Finnish population register data).

We distinguish four levels of education using the International Standard Classification of Education 2011 (ISCED): 'basic', referring to comprehensive basic education or less, inferred from the fact that no post-basic educational degrees were registered for the individual (ISCED 0–2); 'upper secondary' (ISCED 3–4); 'lower tertiary' (ISCED 5–6); and 'higher tertiary' (ISCED 7–8). The distinction between lower and higher tertiary education can be informative, because the tertiary-educated group has become sizeable and can also be heterogeneous in terms of fertility and family behaviour. In Finland, higher tertiary education corresponds to the traditional university sector, whereas lower tertiary education has a more vocational emphasis (preparing for professions in applied engineering, healthcare, and social services) but also includes university bachelor's degrees.

Figure S1 (supplementary material) shows how the relative distributions of men and women aged 35 in the different educational segments have changed over the study period. Over time, increasing proportions of both men and women have attained upper secondary and tertiary education, and the proportion of people with no education beyond the basic level has decreased. At the same time, the disadvantages for this low-educated segment, for example in the labour market, have increased (Oesch and Piccitto 2019). As uptake of tertiary education increases over time, individuals with lower levels of education may face growing obstacles not only in the labour market but also in family formation. The educational expansion has been much stronger among women: 55 per cent of whom had completed tertiary education, while the share among men was much lower, at 37 per cent in 2022.

It is worth noting that individuals of different ages in a given year also represent different birth cohorts, who have lived their young adult lives in different historical circumstances. For example, 30-year-olds in 1987 were born in 1957, whereas in 2022, 30-year-olds represent the 1992 birth cohort. Similarly, 45-year-olds in 1987 were born in 1942, whereas in 2022, they represent the 1977 birth cohort. We provide complementary information on childlessness at certain ages by birth cohort in the supplementary material (Figure S2).

Results

Childlessness trends in the total populations of women and men

Figure 1 shows trends in childlessness at ages 30, 35, 40, and 45 for women and men, separately for the total population and for those born in Finland (see Figure S3, supplementary material, which also includes ages 50 and 55). Overall, childlessness has increased significantly at all four ages during the observation period. Levels are consistently higher for men than for women.

Childlessness at age 45 is the usual indicator of lifetime childlessness. In the total population, childlessness for men aged 45 increased from 19 per cent to 29 per cent during the study period and for women of the same age from 14 to 20 per cent. Both trends show some stabilization towards the end of the period. Levels for men at age 40 rose from 22 per cent to 35 per cent and for women at that age from 15 to 23 per cent.

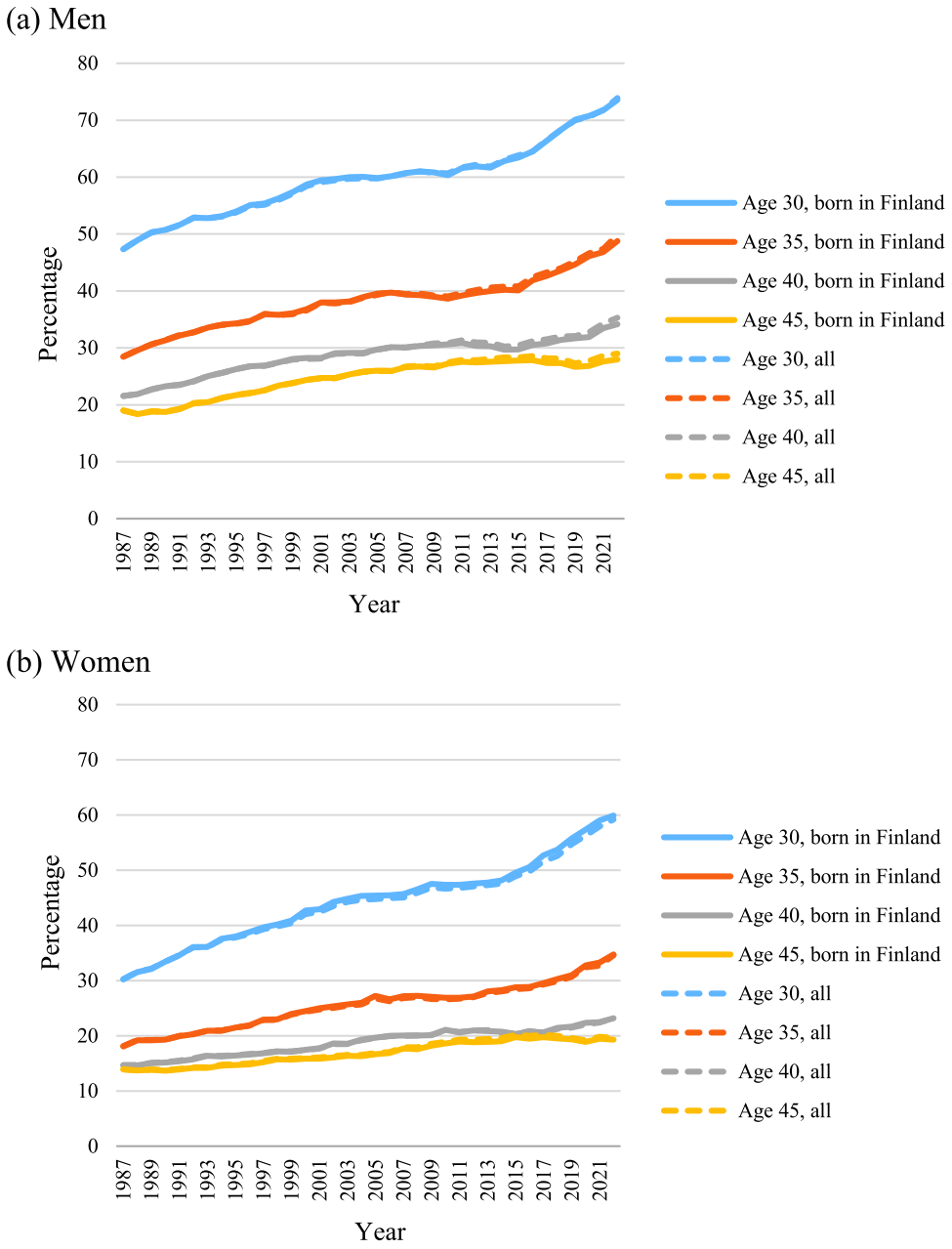

Figure 1 Childlessness (percentage) at age 30, 35, 40, 45 in 1987–2022 by sex: Total population of Finland and those born in Finland

Source: Authors' calculations based on Finnish register data (Statistics Finland).

In contrast to the stabilization in childlessness at age 45 towards the end of the period, for men and women aged 30 and 35 and for men aged 40, the increases accelerated towards the end of the period. This acceleration began circa 2010, which is when the recent fertility decline in Finland started.

For men aged 35, childlessness increased from 28 per cent in 1987 to as high as 50 per cent in 2022, and for women of the same age, from 18 to 35 per cent. That is, levels grew 1.8-fold (men) and 1.9-fold (women) during the 35-year period. Childlessness at age 30 rose from 47 to 74 per cent for men and from 30 to 59 per cent for women. That is, the level for men grew 1.6-fold and for women, it doubled.

As immigration increased, the share of individuals of foreign origin in the Finnish population also increased, and their proportions childless may differ from those of individuals born in Finland, thus affecting the overall trends. However, Figure 1 shows that the differences between those born in Finland and the total population are negligible. In the remaining analyses stratified by education, data only on individuals born in Finland are considered.

Childlessness trends by educational level for men

Figure 2 shows the trends in childlessness at ages 45, 40, 35, and 30 by educational attainment for men, while Figure 3 shows the corresponding childlessness trends by educational attainment for women. (Figure S4, supplementary material, also shows childlessness at age 50 by education.)

Educational differences for men at age 45 (Figure 2(d)) remained fairly constant over the study period. The level of childlessness is inversely related to the level of education. Over the period, childlessness increased in all educational segments. The increase seems to have slowed down or even stopped for men with a tertiary education. In 2022, the share childless at age 45 was 22 per cent for men with higher tertiary education, 23 per cent for men with lower tertiary education, 30 per cent for men with upper secondary education, and 38 per cent for men with no more than basic education.

Educational differences in childlessness and their trends for men at age 40 (Figure 2(c)) are similar to those at age 45. The only notable difference is that the increase in childlessness continues until the end of the study period across all educational segments.

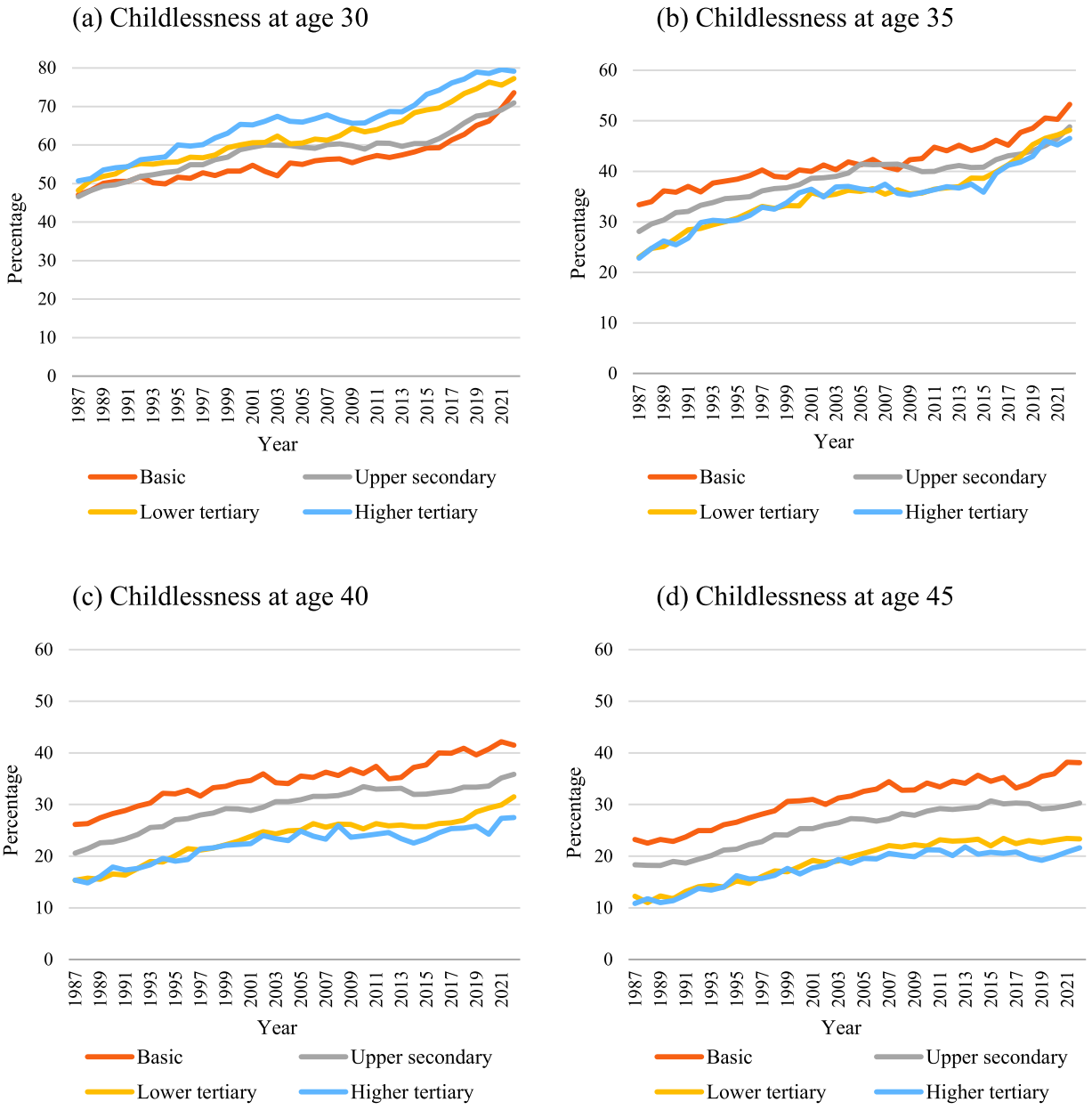

Figure 2 Childlessness (percentage) at age 30, 35, 40, and 45 by level of education, 1987–2022: Men born in Finland

Source: As for Figure 1.

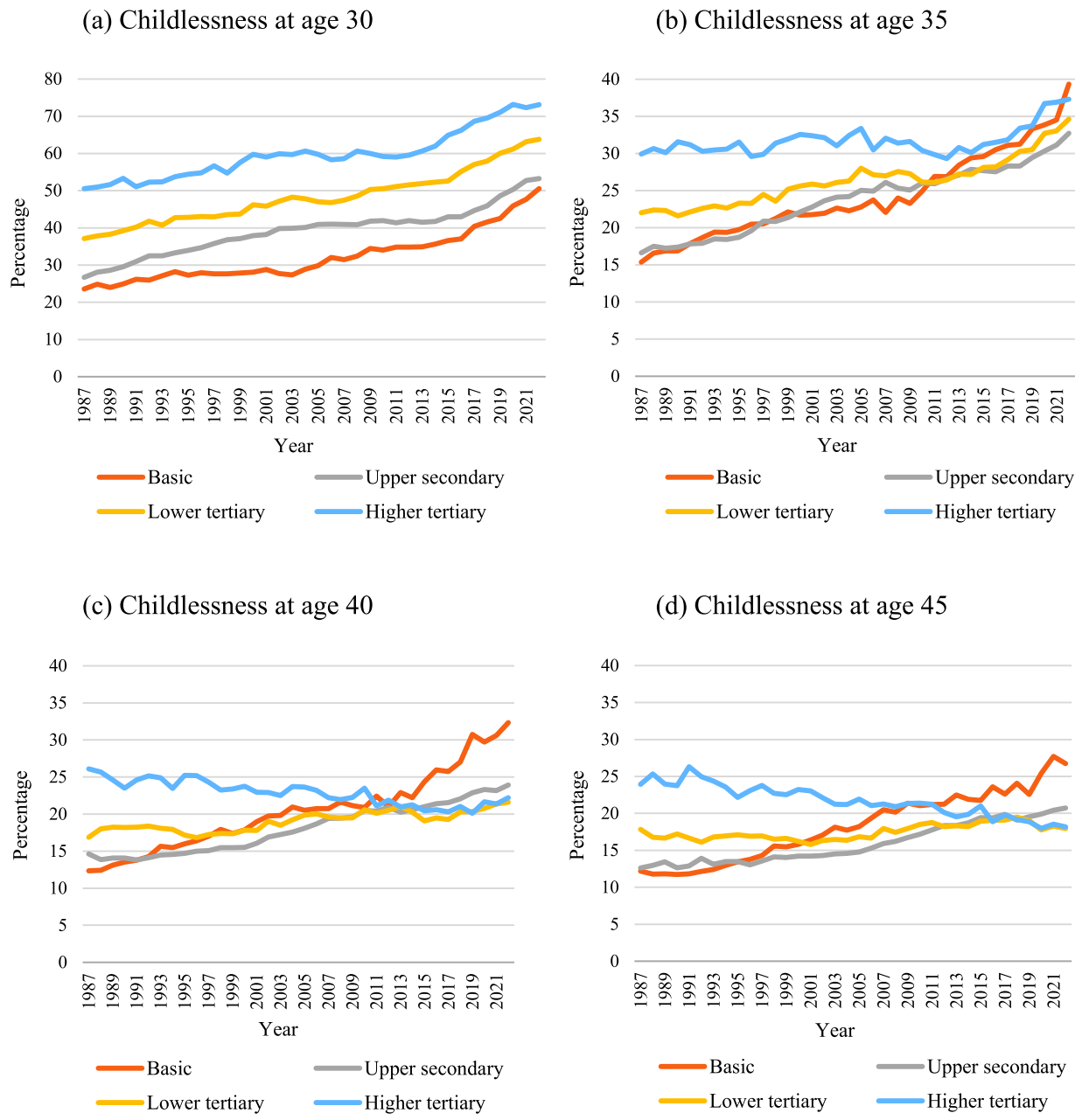

Figure 3 Childlessness (percentage) at age 30, 35, 40, and 45 by level of education, 1987–2022: Women born in Finland

Source: As for Figure 1.

The educational patterns and trends are different for younger men. At age 30, childlessness is quite consistently and positively associated with educational attainment (Figure 2(a)). The differences between men with tertiary education and other men increased over the period. The fact that childlessness at age 30 is highest among the highly educated follows the well-known pattern that many highly educated men and women postpone starting a family until they have finished their studies. After that they tend to 'recuperate' (i.e. catch up), with shorter birth intervals. In 2022, childlessness at age 30 was remarkably high in all educational segments: around 80 per cent for men with tertiary education and over 70 per cent for men with basic or upper secondary education.

By age 35, men with a tertiary education are already experiencing lower childlessness than those with less education (Figure 2(b)). However, childlessness in this age group has risen substantially over the past decade, with an even sharper increase among men with tertiary education, leading to a convergence with the childlessness levels of men with upper secondary education. This is an unexpected

development because, in the previous decade, childlessness among tertiary-educated men at age 35 had stabilized and remained well below the levels observed among men with lower education.

Childlessness trends by educational level for women

The childlessness of women at age 45 by education (Figure 3(d)) shows a reversal that is consistent with previous studies on cohort fertility. In the first half of the observation period, childlessness at age 45 was highest by far among women with higher tertiary education. However, over the whole observation period, childlessness decreased among women with higher tertiary education, whereas it increased in all other education segments and most strongly among women with the lowest education. As a result, educational differences in lifetime childlessness have reversed, with childlessness now being highest among women with the lowest educational attainment, lowest among women with tertiary education, and intermediate among women with upper secondary education.

The educational differences and trends for women aged 40 (Figure 3(c)) are very similar to those for women aged 45. This is consistent with the fact that few women have their first child after age 40.

As for men, the patterns and trends for women are different at younger ages. At age 30, childlessness is consistently and positively associated with educational attainment, and we also observe a steep increase in childlessness over the last decade in all educational segments (Figure 3(a)). The differences between educational levels are larger than for men and have been large throughout the observation period.

Turning to age 35 (Figure 3(b)), interesting trends also emerge for women. At age 35, childlessness is still highest among women with the highest level of education and lowest among women with basic or upper secondary education, with lower-tertiary-educated women falling in between. Until around 2010, we observe a steady increase in childlessness at this age for all educational segments except those with higher tertiary education. Since around 2010, the increase has been strongest for women with the lowest educational attainment. However, over the last decade, there has also been a significant increase in childlessness for women with lower or higher tertiary education. For example, between 2014 and 2022, childlessness increased from 30 to 37 per cent for women with higher tertiary education.

Conclusions

In highly advanced societies, the postponement of parenthood to later and later ages has been a prominent feature of fertility trends for decades. Many of those who postpone parenthood beyond age 30, for example, will have children later in life. However, the postponement of childbearing can also lead to an increase in ultimate childlessness and a decrease in completed fertility overall (Beaujouan et al. 2023; Winkler-Dworak et al. 2024). Women's fecundity declines rapidly as they approach age 40, and an advanced age at pregnancy is associated with an increased risk of miscarriage and several other adverse reproductive outcomes (Schmidt et al. 2012).

This study describes period trends in childlessness at ages 30, 35, 40, and 45 by educational attainment for men and women in Finland between 1987 and 2022. We complement previous cohort-based studies by providing a period-based perspective that highlights recent changes in fertility trends, thereby offering fresh insights into ongoing demographic developments.

Our study shows that men's childlessness has increased at all ages and in all educational segments. At ages 45 and 40, the increases in childlessness are still modest compared with those at younger ages, but childlessness still increased by about 10 percentage points over the observation period. At these ages, men's childlessness is inversely related to educational attainment. These differences have remained remarkably constant over time. For women, childlessness has also increased at ages 45 and 40, except for women with higher tertiary education, for whom a decline is observed. For women with lower educational attainment, childlessness increased during the observation period, resulting in a reversal of the educational gradient in women's childlessness at these ages from positive to negative. As a result, the relationship between education and entry into parenthood for women has become more similar to that observed for men.

At age 35, different patterns emerge. Childlessness at this age has increased for both men and women and has done so remarkably rapidly over the last decade. Men with tertiary education are less likely to be childless than men with less education. However, over the last decade, childlessness at age 35 has increased in all educational segments. Surprisingly, the increase has been even steeper for men with tertiary education, leading to their percentages childless converging with those of men with upper secondary education. In contrast to men, women

with higher-tertiary-level education display higher childlessness than women with lower levels of education. Childlessness among 35-year-old women with the highest educational attainment remained fairly stable until the mid-2010s, whereas in other educational segments, childlessness increased continuously. Since 2014, there has been a sharp increase in childlessness across all educational segments, notably including higher-tertiary-educated women. While educational differences in childlessness at this age do not necessarily translate into similar differences once these women reach age 40 or 45, the sharp increase in childlessness we observe especially among highly educated women could mean that the negative educational gradient in lifetime childlessness observed in previous cohort studies is weakening.

At age 30, childlessness is very high for both men and women and is positively associated with educational attainment. In this age group, most young adults are still postponing entry into parenthood and are likely to have children in future. This is particularly the case for the highly educated, many of whom delay entry into parenthood during their studies. Moreover, educational differences in childlessness at age 30 have increased for men over the observation period. It is noteworthy, however, that childlessness at age 30 also increased among the less educated, for whom long periods of education are unlikely to explain the delay in the entry into parenthood. Employment uncertainty, for example, may lead to postponement of parenthood among the less educated. However, the fact that almost half of women and more than 70 per cent of men in these educational segments are childless at this age could also indicate a change in preferences that increasingly favours later entry into parenthood. Furthermore, the increases in childlessness are likely connected to changes in partnership behaviour, characterized by declining union formation and rising dissolution rates, especially among individuals with lower educational levels and in younger age groups (Hellstrand et al. 2022; Jalovaara and Andersson 2023; Rahnu and Jalovaara 2023). Finally, it is important to recognize that the relationship between educational attainment and entry into parenthood is dynamic and multifaceted. For instance, in addition to education affecting family formation, early parenthood can interrupt an educational career.

Our findings of increasing proportions childless at ages 30 and 35 are consistent with the dramatic decline in Finland's period TFR since 2010. This decline was due largely to a decrease in first births in the under 40 age groups (Hellstrand et al. 2021). Although many of the currently childless young adults are likely to have children later, postponing childbearing well beyond age 35 could increase lifetime childlessness. A previous study showed that the hypothetical proportion of women expected to remain childless—based on period first-birth rates—increased from about 16 per cent to 25 per cent between 2010 and 2018 for women with higher tertiary education and from about 33 to 51 per cent for those with the lowest education (Hellstrand et al. 2022). However, this did not include the period after 2018 when childlessness at age 35 accelerated. High proportions childless at age 35 among the highly educated may indicate growing uncertainties in family formation, even among those with greater social and economic resources. Moreover, as working life becomes more intensive (Green et al. 2022), the benefits and services provided by the welfare state to support the reconciliation of work and family life may not be sufficient. However, the fact that we find a sharp increase in childlessness at ages 30 and 35 after 2010, across all educational segments and for both men and women, highlights the all-encompassing nature of the fertility decline and the fact that there is likely to be a variety of contributing factors. Taken together, our findings contribute to the growing literature on family demography and socio-economic differences in fertility, providing valuable insights into how childlessness patterns evolve over the life course for men and women.

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Author contributions

CRediT: **Marika Jalovaara:** Conceptualization, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing;

Anneli Miettinen: Conceptualization, Data curation, Formal analysis, Investigation, Validation, Visualization, Writing – original draft, Writing – review & editing.

Disclosure statement

No potential conflict of interest was reported by the authors.

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