Stronger fertility declines in educational fields associated with higher economic uncertainty

The Nordic countries' relatively high and stable fertility levels prior to 2010 have existed concurrently with large variation in fertility levels by field of education. Women educated in the fields of health and teaching tend to have the highest levels of fertility and the lowest levels of childlessness, while women educated in the fields of arts and humanities tend to have the lowest levels of fertility and the highest levels of childlessness.

This suggests that family-work reconciliation may not be as easy for women in all fields – a finding of significance especially in the light of the social policy goals in the Nordic countries.

Moreover, the findings of this study indicate that with the fertility decline in the 2010s, the fertility levels across fields of education are further diverging, especially in the case of the first births.

The aims of the study

The drivers behind the Nordic fertility decline in the 2010s are not fully understood. Previous studies have identified declining first births in childless couples being the main driver of the decline but other than that pronounced variation has not been found across population sub-groups.

However, first births declined more strongly among the least educated and those with a weaker labour market attachment. This is of particular concern, and also the longterm trends in the Nordic countries show increasing levels of ultimate childlessness among the least educated. Consequently, the previous positive educational gradient in ultimate childlessness has turned negative, meaning that the lower educated women are nowadays the most likely to remain childless. Less is known about the unfolding horizontal inequalities, i.e. across fields of education, in family formation among the majority of • The 2010s fertility decline was weaker in educational fields with the highest initial fertility levels (health, welfare, and education) and women in agriculture.

• Fertility declined more strongly among women with the lowest initial levels (ICT, arts and humanities).

• The extent of the fertility decline was associated with uncertainty measures: fertility declined more strongly in fields with higher unemployment and lower income, and with a lower share employed in the public sector.

• The uncertainty measures explained together one-fourth of the decline in the total fertility rate and two-fifths of the decline in first births.

• The results suggest that those with a weaker labor market position face increasing barriers to family formation. Finnish policies should aim to reduce these barriers.

women educated to secondary and higher levels.

The aim of this study was to examine how fertility declined by field of education in Finland since 2010. First, we aimed to study potential variation in the strength of the decline across different fields, and second, whether the strengths of the declines were associated with the characteristics of the fields reflecting economic uncertainty. As the fields of education differ regarding prospects for economic (un)certainty (e.g. future



Figure 1: The total fertility rate (TFR) and the share expected to ever have a first birth (TFRp1), displayed by three-year moving averages, and the relative change (baseline 2010) by level and broad field of education in 2004–2019.

employment conditions, income security, and work environment) differences in the extent of the decline between fields could provide insights into the mechanisms underlying the fertility decline overall.

The uncertainty measures of fields considered were the share of women unemployed, mean annual income, and the share of women working in the public sector.

The strongest declines were in ICT, arts and humanities

Figure 1 shows the total fertility rate (TFR) in 2004–2019 and the changes relative to 2010 by level and field of education. TFR refers to the estimate of the children born to a woman in her lifetime if she experienced the fertility conditions, i.e. age-specific fertility rates, as observed in a current year. TFRp1 refers to

the share expected to ever have a first birth.

Before the onset of the decline, TFR ranged from 1.37–1.42 and TFRp1 from 0.62–0.65 among those with general education or education in ICT, to TFR of 2.19 among women educated in health and welfare at the secondary level. Similarly at the tertiary level, women educated in ICT and arts and humanities had TFR 1.66–1.72, while the TFR of women educated in teaching was 2.57.

In the 2010s, all fields saw declines in their fertility levels, but there was variation in the strength of the decline. Overall, fertility declined more strongly among women educated in fields with initially lower levels of fertility, especially among women educated to the secondary and lower tertiary level.

In the case of TFR, the strongest declines were observed in ICT, arts and humanities, and general education at secondary level



(33–38%), in ICT at lower tertiary level (more than 40%), and in ICT, natural sciences, and engineering at higher tertiary education (30–33%). The weakest declines in TFR were observed among women educated in health, welfare and agriculture (around a 21–24% decline at all levels).

The growing divergence between fields is particularly pronounced in the case of first births. At secondary level, the decline in the share expected to ever have a first birth varied from 12% in health and welfare, to 27% in general education, arts and humanities, and further to 40% in ICT.

Fertility decline most strongly associated with risk of unemployment

Figure 2 illustrates the bivariate relationships between the uncertainty measures (share

unemployed, mean annual income, and share in the public sector) in the field in 2018 and the relative change in TFR across fields.

The change in the TFR was associated with all three measures of uncertainty: the strength of the fertility decline increased with higher unemployment, lower mean income, and lower share working in the public sector within the field.

Multivariate regression models including all three uncertainty indicators based on standardized data were used to explore how much the variables combined explain the variation in the fertility decline between fields. These uncertainty models explain 24% and 40 % of the variation in the strength of the decline in TFR and the share expected to ever have a first birth between fields. The association with unemployment remains the strongest association net of other measures, while the association with income is no longer significant when other uncertainty measures and the level of education have been taken into account. The link of public sector employment remains significant net of other measures, although its coefficients are attenuated in the multivariate model.

Social inequalities in childbearing are widening

The findings of this study add to the previous evidence of the 2010s fertility decline, which demonstrated elevated first birth declines among the least educated in the Nordic countries. The current results highlight that first births are being increasingly postponed or forgone also by women who have attained education at the medium or high level in fields characterized by higher economic uncertainty. Hence, the current findings provide further support for the claim that social divergence in fertility is growing in the Nordic countries, especially in the entry into parenthood.

The main suggested theoretical explanation for the fertility declines in high-income countries in the 2010s is increased perceived uncertainty that makes the future less predictable for individuals. Our findings on Finland indicate that also objective economic uncertainty mattered for the decline: women educated in fields associated with higher economic uncertainty seem to have become more sensitive to their circumstances. This may stem from, for instance, a changing labour market (e.g. increased globalization and automation), weaker income growth among the lower paid, and rising living costs (especially rents and house prices), leaving those with less secure employment more hesitant to realize childbearing plans.

Nevertheless, as fertility declined also in fields associated with secure employment prospects, there are clearly also other factors underlying the recent fertility decline.

The growing social inequality in childbearing illustrates what might be the downside of strong work-family reconciliation policies and the dual-earner model: a secure labor market position of both partners has increasingly turned into a prerequisite for childbearing of couples, while those with a weaker labor market position are facing increasing barriers to their family formation. Finnish policy measures should aim at alleviating the barriers to childbearing, which in contemporary Finland are in many cases not related to the incompatibility of a wellestablished career with childbearing, but more often to the lack thereof.

Policies promoting education and employment also support family formation. At the same time, it promotes the well-being and stability in life for both children and adults and reduces economic and social inequality.

Data and methods

We used detailed Finnish full population register data and calculated TFRs and shares expected to ever have a first birth between 2010 and 2019 for 153 groups of education distributed over four education levels.

Further, we used weighted multivariate linear regression to analyse the association between the characteristics measuring economic uncertainty (share of women unemployed, mean annual income, and the share of women employed in the public sector) and the fertility decline between fields.

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