

## **Gendered Patterns of Childlessness Across Educational Levels in Low and Very Low Fertility Countries**

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### **1 Introduction**

In some countries, fertility behaviors have gradually converged across educational levels, whereas in others, differences persist. Childlessness represents one of the main dimensions associated with contemporary fertility changes. So, examining the relationship between educational differences and childlessness is of particular importance (Beaujouan, Sobotka, et al. 2017).

Lifetime childlessness, understood as the proportion of individuals without children at the end of the reproductive period, has received increasing attention from scholars in European countries (Brini 2020; Kravdal 2021; Miettinen et al. 2015). In recent decades, this focus has intensified due to the low and very low fertility levels observed worldwide (Sobotka 2017; Beaujouan, Sobotka, et al. 2017). Evidence shows a considerable share of the population remaining childless at the end of the reproductive period, ranging between 8% and 23% for women, and between 10% and 30% for men during 2005–2010 in Europe (Beaujouan, Sobotka, et al. 2017; Miettinen et al. 2015).

Beyond overall cross-country levels of childlessness, within-country heterogeneities have been identified as relevant factors to consider in analyses, with educational level being one of the most crucial (Beaujouan, Brzozowska, and Zeman 2016; Jalovaara and Miettinen 2024). Previous research has shown that educational disparities in childlessness among women have tended to disappear, diminish, or even reverse over time, with marked regional variation (Wood, Neels, and Kil 2014; Beaujouan, Brzozowska, and Zeman 2016).

For instance, the Nordic countries have experienced a shift in the educational gradient of childlessness, mainly associated with women's behaviors (Jalovaara, L. Andersson, and Miettinen 2022; Jalovaara and Miettinen 2024). In the past, high childlessness rates among more educated women was observed in some Nordic countries, while more recent cohorts in Sweden and Finland exhibit a reversal, showing a negative gradient (Jalovaara, L. Andersson, and Miettinen 2022).

Conversely, Central and Eastern European (CEE) countries have shown a weak educational gradient in women's childlessness, whereas a strong and positive gradient has been observed in other countries, such as Mediterranean ones (Spain and Italy), France, the Netherlands, and Australia (Wood, Neels, and Kil 2014; Beaujouan, Brzozowska, and Zeman 2016). In Spain, for instance, although a strong positive educational gradient in childlessness persists, the magnitude of the difference between the highest and lowest educational groups has narrowed, partly due to educational expansion (Reher and Requena 2019).

In contrast, there remains a significant gap in studies examining heterogeneity in childlessness by educational level and region among men. Existing research indicates that men with lower levels of education exhibit the highest rates of childlessness (Martín-García 2009; Miettinen et al. 2015; Nisén et al. 2018; Jalovaara, L. Andersson, and Miettinen 2022). Miettinen and colleagues (2015) provided an overall picture of these trends in Europe, showing that 13 out of 19 analyzed countries displayed the negative educational gradient in childlessness levels, although marked regional differences were observed.

Considering the existing literature, we emphasize the importance of adopting a life course approach to analyze gender differences in the relationship between educational level and childlessness across countries. Evidence from the Nordic

countries shows that, under a life course perspective, the educational gradient in women's childlessness is better suited to capture institutional changes than analyses focusing on ultimate childlessness (Neyer, Hoem, and G. Andersson 2017).

Additionally, country-specific evidence indicates that processes of family formation and dissolution over the life course are fundamental for understanding divergences in childlessness between men and women, as they mediate - or can be mediated by - the role of educational attainment. For example, among Finnish men, dynamics in the marriage market play an important role in explaining the prevalence of childlessness beyond educational background, both at the national (Nisén et al. 2018) and subnational levels (Schubert and Dudel 2025).

## **2 Objective**

This study investigates the mechanisms underlying educational differences in childlessness among women and men in countries with low and very low fertility levels. First, adopting a life course perspective, we describe the trends in childlessness by educational attainment among women and men to determine whether gendered educational patterns persist over the life course. Second, we analyze how family formation and dissolution influence the likelihood of remaining childless among men and women across educational levels and countries.

## **3 Data and Analytical Approach**

We used the Harmonized Histories Dataset II (HHII), created as part of a joint project led by the Generations and Gender Programme (Schumann, Allegra, and Meli 2024). The HHII dataset includes data from 11 countries — 10 European nations and Uruguay. Microdata for each country come from either the Family and Fertility Surveys (FFS) or the Generations and Gender Surveys (GGS). These sources are highly comparable in terms of data collection design, questionnaire content, and fieldwork period, enabling robust cross-national comparisons.

For the analyses presented here, we focused on eight countries with the largest sample sizes by gender and educational level: Norway, Italy, Uruguay, Croatia, Austria, Germany, Denmark, and the Czech Republic <sup>1</sup>. In these countries, the survey data were collected between 2016 and 2023. To harmonize the analysis, we considered individuals aged 40 to 60 years at the time of data collection, corresponding to birth cohorts 1960–1980 <sup>2</sup>.

We followed individuals from age 15, the conventional onset of the reproductive period, through age 40. Educational attainment was classified using the ISCED 1997 scheme, aggregated into three levels: Low (ISCED 0–2), Medium (ISCED 3–4), and High (ISCED 5–6).

Two analytical strategies were adopted to address the study objectives. First, we conducted a descriptive analysis using non-parametric estimation of the probability of remaining childless among women and men, by educational level and partnership status, across the reproductive life course. The Kaplan–Meier estimator was used to account for variations by country, gender, and relevant covariates.

In future work, we will extend the analysis using discrete-time survival models that account for country-level variation to provide a more comprehensive methodological framework. Additionally, we will perform sensitivity analyses on model specification, variable construction (education and partnership status), and the observational window to minimize potential selectivity bias and other sources of distortion.

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<sup>1</sup>For further analyses, a comprehensive revision of data from other HHII countries, as well as the potential inclusion of comparable datasets from non-HHII countries, will be conducted.

<sup>2</sup>As an exception, Italy conducted its survey in 2016, so we include birth cohorts 1956–1976.

## 4 Preliminary and further expected results

To highlight the main preliminary findings, we first describe the distribution of educational attainment by country and gender. Across cohorts, all countries exhibit clear evidence of educational expansion among women. Among men, on the other hand, the trend of educational expansion is less pronounced or more heterogeneous across countries.

The Figure 1 presents the childlessness survival function across age, by educational attainment, sex, and country. At age 40, representing ultimate childlessness, the results align with previous literature: men consistently show higher proportions of childlessness than women; among women, a positive educational gradient is observed in some countries, whereas in several Nordic and Central and Eastern European (CEE) countries the gradient is negative or weak; and, among men, a positive gradient appears in five out of eight countries — Austria, Croatia, Denmark, Germany, and Norway.

When examining childlessness trajectories across ages, it becomes evident that the educational gradient evolves over the life course, with reversals occurring at specific stages for both women and men. For example, in Germany, while the overall relationship between education and childlessness appears weak by the end of the reproductive period, there is considerable heterogeneity before age 30, suggesting that early-life dynamics play a role in shaping later outcomes.

These life course differences likely reflect the interplay between individual decisions on family formation and dissolution and other institutional changes that can affect this periods of someone’s life. Further analyses will explore these mechanisms in depth to better understand how educational background interacts with family trajectories to influence childlessness across genders and countries.

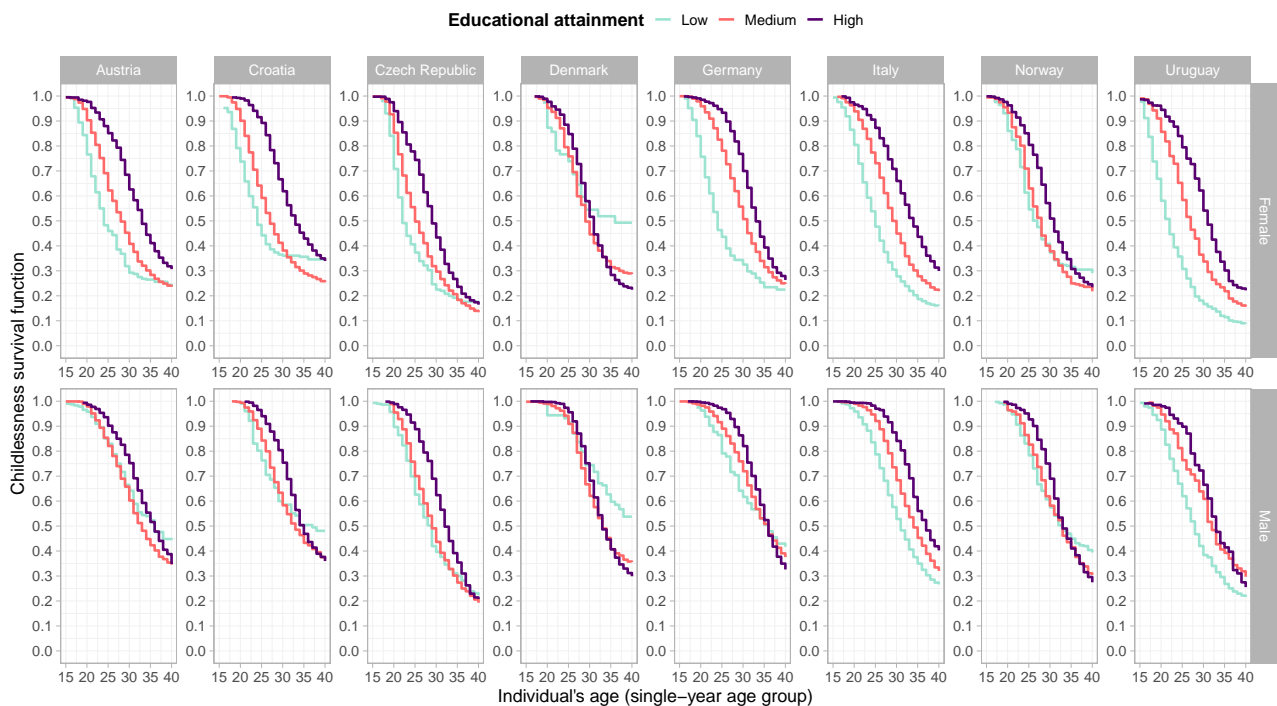


Figure 1: Childlessness survival function over ages by educational level, for men and women in eight selected countries. Source: Calculated by the authors based on the Harmonized History dataset II.

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