Recent trends and contextual determinants of childlessness of women and men

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The aim of this paper is to study how contextual factors may predict childlessness of women and men in the recent period in a number of European countries. As ultimate childlessness needs to be measured at the end of the fertile period, most studies on childlessness take a cohort perspective. However, a cohort perspective may fail to shed light on developments in recent periods. Therefore, in this paper, we take a novel approach to childlessness from a period perspective, by investigating trends in 'synthetic childlessness rates'. These are based on parity- and timing-adjusted total first birth rates and are validated against cohort-based estimates of childlessness. Our study utilizes the increasing availability of register-based data in Europe, which allows studying childlessness of both women and men at the level of sub-national regions. The key interest is to describe trends by gender and educational attainment from a period perspective at the national and sub-national level, and explain these trends by contextual factors at the sub-national level. The sub-national dimension is found to be helpful in explaining potential mechanisms through which societal changes could be related to changes in fertility (Fox, Klüsener and Myrskylä 2018). We also shed light on whether the effects of contextual factors potentially differ across different age and educational groups. The study is based on high-quality register-based data from Finland, Norway, Netherlands, and Spain from the 1990s up to 2016. To study whether variation in sub-national regional factors explains variation in childlessness rates at the sub-national level we use pooled cross-sectional time-series analysis.

Background

Increasing childlessness is part of the demographic changes that take place across Europe and other industrialized countries (Sobotka 2017; Frejka 2017). In a historical perspective, the trend in cohort childlessness in Europe shows a U-shaped pattern in the share of childless women born between 1900 and the beginning of the 1970s (Sobotka 2017). Childlessness levels do however not show a uniform pattern: there is increasing evidence for variation in levels across countries, genders and social groups.

First, countries differ in the share of women remaining childless. Across Europe, the German speaking countries and the Sothern European countries have the highest shares (e.g. around 20 % in Italy and Spain) and the Central European countries the lowest shares of women remaining childless (e.g. around 10 % in Czech Republic, Hungary, Poland and Bulgaria), while the Western and Northern European countries typically fall in between (Sobotka 2017). Further, higher levels of childlessness typically predict lower overall fertility across countries, e.g. Italy and Germany holds around 20% of childlessness and around 1.5 children per women in completed cohort fertility (Sobotka 2017), although there are some notable exceptions to this. For instance, in the UK both

childlessness and overall fertility are at a comparatively high level (Berrington 2017). Such exceptions highlight the need for a focus on childlessness per se.

Second, research on male fertility is still scare compared to research on women's fertility, but an increasing number of studies have focused on men over the years. Currently, there is not much research that explicitly compares childlessness of men and women (Kneale & Joshi, 2008; Kravdal & Rindfuss, 2008; Toulemon & Lapierre-Adamcyk, 2000). A recent study from the Nordic countries based on high-quality register data shows a relatively high level of childlessness among men as compared to women, with a relatively stable overall gender difference in ultimate childlessness of around 6-10 percentage points across cohorts (Jalovaara et al 2018). Also earlier studies have pointed towards higher ultimate childlessness among men than among women.

Third, the social gradient in childlessness is substantial. Remaining childless is typically more common among women educated to higher levels (Wood et al 2014; Miettinen et al 2015; Tanturri et al 2015). On the contrary, childlessness is higher among men with lower educational level than among those with higher educational level (Lappegård and Rønsen 2013; Trimarchi and van Bavel 2017; Nisén et al 2014, 2017). However, a recent study from the Nordic countries shows that remaining childless has become more common among women with lower education than among women with higher education in the female cohorts born in the early 1970s in Denmark, Norway and Sweden (Jalovaara et al 2018). Taken together, these studies also reveal variation in the gender difference in the level of childlessness between educational groups.

Theoretical predictions

Focusing on institutional contexts and welfare policies, theories on gender and fertility suggest lower fertility and higher shares of childlessness as long as there is a mismatch between gender equality in taking on economic responsibilities and gender equality in the domestic responsibilities (Esping-Andersen and Billari 2015; Goldscheider, Bernhardt and Lappegård 2015). These theories suggest that women with higher education are most strongly influenced by such mismatch and most responsive to increasing gender equality within the family.

To study whether contextual factors predict childlessness of different groups, we consider five sets of factors. We assume that it is particularly important to measure contextual factors at the sub-national regional level, because the local conditions are likely to be more important determinants of individual choices and constraints of childbearing than country-level conditions (Wood, Klüsener, Neels, and Myrskylä, 2017).

The first indicator concerns modern attitudes. We consider the share of the population educated to the tertiary level as a proxy for such attitudes. Following the Second Demographic Transition (SDT) idea (Surkyn and Lesthaeghe 2004), remaining childlessness may relate to new lifestyles and changing values and attitudes. We predict higher childlessness with larger shares educated to the tertiary level. In addition, we predict increases in childlessness alongside with the diffusion of new lifestyles via communication technology (measured by the share of households with internet access).

The second set includes changes of urbanization and age structure. Following a similar argument from the SDT as described above, we predict higher childlessness in more urban regions (measured by population density), because of cultural norms promoting childless lifestyles, and in regions with a younger population, because of the likelihood of more youthful lifestyles (measured by the old-age dependency ratio).

The third indicator concerns economic conditions. Having a stable job (measured as unemployment rate) and sufficient income potential (measured by level of GDP per capita) shows to be of importance for people's desire for children (Neyer, Lappegård and Vignoli 2013). We predict lower childlessness in regions with better general economic conditions (Fox, Klüsener and Myrskylä 2018; Andersson 2000).

The fourth indicator concerns women's empowerment. Higher rates of female versus male labor force participation are viewed to predict stronger female autonomy and bargaining power of women and higher opportunity costs of childbearing. For men, the first mechanism may be of most importance and for women the second. We predict higher childlessness in regions with relatively high female labor market participation.

The fifth indicator measures the availability of potential partners. Finding a partner requires a 'marriage market' or communities with a certain level of homogamy in age and preferably educational attainment. We predict higher childlessness in regions with a large gender gap in age and educational distributions (at childbearing ages) (van Bavel 2012).

As levels of childlessness and variation by social groups therein differ substantially between women and men, we will investigate whether and, if so, in which way, the aforementioned contextual factors might affect childlessness of each of these groups.

Analytical strategy

This study utilizes the increasing availability of administrative data sources for research purposes. Traditionally demographic research only in the Nordic countries has benefited from the availability of such data. Despite increasing availability, the access to these data still often remains restricted. The Max Planck Institute for Demographic Research recently founded a European network in order to bring together researchers with access to such data sources. This study builds on this Register-Based Fertility Research Network in order to employ register-based data in a number of European countries for studying trends and contextual determinants of childlessness of women and men in recent periods. In this study, we will extend the gendered view on childlessness trends beyond the Nordic countries to countries representing also other parts of Europe and in which detailed register-data is available. This study will cover Finland, Norway, Netherlands and Spain, and possibly some other countries. In these countries, we utilize the available individual-level data to identify annual counts of first births for women and men and the childless female and male population at risk of having the first birth.

Further, the birth and risk population counts are broken down by age group, current educational attainment (incl. enrolment status), and current region of living. This allows the calculation of synthetic childlessness rates for sub-groups distinguished by these characteristics. For harmonization of educational attainment over the study period and across countries we use the International Standard Classification of Education (ISCED) and distinguish between low (ISCED 0-2), medium (ISCED 3-4) and high (ISCED 5-8) education (OECD, 2015). For comparability of the region of living over time and across countries we use the Nomenclature of Territorial Units for Statistics, level 2 (NUTS2) (Eurostat, 2011), which refers to large regions within a country. (e.g. in Finland five large regions, in Norway seven large regions, in Spain 19 autonomous communities and cities, and in the Netherlands 12 provinces). These regions generally cover populations

between 800,000 and three million inhabitants. For the study of contextual determinants of period childlessness trends, we use information provided readily at the regional level by Eurostat increasingly from the year 2000 onwards (Eurostat, 2018).

In order to investigate what share of women or men would have remained childless in period t, had they experienced the conditions affecting their fertility in this period, we calculate period-based 'synthetic childlessness rate' (SCR) defined as SCR = 1-TFR_{1L}(t), where TFR_{1L}(t) refers to total first birth rate in period t based on first type of age-specific rates (Bongaarts & Feeney, 2008), where the denominator consists only of female/male population without children. Using parity-specific counts of women/men in the denominator, we control for fluctuation caused by changes in the size of female/male population at the risk of having the first child (i.e. staying childless) (Bongaarts & Sobotka, 2012; Rallu & Toulemon, 1994). In addition, we calculate the SCR with adjustment for change in the mean timing of first childbearing (Bongaarts & Feeney, 1998), denoted as TFR_{1L}*(t). We define this as $TFR_{1L}1$*(t) = $TFR_{1L}1$ (t) / (1-r_1(t)), where tempo adjustment factor r_1(t) measures the rate of change in the mean age of first birth. This is to see the extent to which the period-indicator may be affected by the changing mean age of first birth, e.g. increasing mean age during a period will contribute to elevated SCR in the corresponding period. To validate the measure, we contrast the SCRs with cohort-based childlessness estimates, matching the period estimate with the cohort estimate in a year in which a cohort experienced it's mean age at first childbearing. We calculate the SCRs from the early 1990s until the most recent year by country, sub-national region, and educational attainment.

In order to study whether contextual characteristics predict variation in childlessness at the regional level, we regress the synthetic childlessness rates without and with adjustment for changes in tempo of childbearing on a number of other characteristics of the corresponding regions. We measure the independent variables, regional contextual characteristics, with one-year time lag (at t-1). Firstly, we explore the correlation of these independent variables with SCRs of women and men within each country on an annual basis. This gives indication of the basic associations between the independent regional variables with the SCR of women and men within countries over time. Secondly, we pool the countries together for a linear regression model, where we predict the SCR in a region i in year t within a country c with the independent characteristics of a region i in year t-1 within a county c. The tentative model specification includes country- and region-level fixed effects, which would control for time-constant factors that influence both the level of independent variables as well as the level of childlessness of a country / region (Allison 2009). We estimate separate models for SCRs of women and men. Additionally, we explore whether the changes in contextual factors may affect differently the fluctuation of childlessness rates of women or men over time at different educational levels or at different ages (16-30 vs. 31-45).

Overall, our study provides new insights into the developments of childlessness in recent periods, and how contextual determinants might predict childlessness of women and men in Europe. The new contribution of the study is to provide a gendered view on the trends and contextual determinants of childlessness in recent periods.

References

Allison, P. D. (2009). *Fixed Effects Regression Models. Series: Quantitative applications in the social sciences, No. 160*. Thousand Oaks, CA: Sage.

Andersson, Gunnar. "The impact of labour-force participation on childbearing behaviour: Pro-cyclical fertility in Sweden during the 1980s and the 1990s." *European Journal of Population* 16.4 (2000): 293-333.

Berrington, A. (2017). Childlessness in the UK. In M. Kreyenfeld and D. Konietzka (Eds.), *Childlessness in Europe: Contexts, causes, and consequences* (pp. 57–76). Berlin: Springer.

Bongaarts, J., & Feeney, G. (1998). On the quantum and tempo of fertility. *Population and Development Review*, 271-291.

Bongaarts, J. and T. Sobotka (2012). A demographic explanation for the recent rise in European fertility. Population and Development Review 38.1, 83- 120.

Bongaarts, J., and G. Feeney (2008). The quantum and tempo of life-cycle events. In How Long Do We Live? (pp. 29-65). Springer, Berlin, Heidelberg.

Esping-Andersen, G., and Billari, F. (2015). Re-theorizing family demographics. *Population and Development Review, 41*(1), 1–31.

Eurostat. (2011). *Regions in the European Union. Nomenclature of territorial units for statistics.*

Eurostat. (2018). Database: Regional Statistics by NUTS classification. Retrieved 16.8.2018, from Eurostat https://ec.europa.eu/eurostat/data/database

Frejka, T. (2017). Childlessness in the United States. In M. Kreyenfeld & D. Konietzka (Eds.), *Childlessness in Europe: Contexts, Causes, and Consequences* (pp. 159-179). Cham: Springer International Publishing.

Goldscheider, F., Bernhardt, E., and Lappegård, T. (2015). The gender revolution: A framework for understanding changing family and demographic behavior. *Population and Development Review, 41*(2), 207–239.

Jalovaara, M., G. Neyer, G. Andersson, J. Dahlberg, L. Dommermuth, P. Fallesen, T. Lappegård (2018). Education, Gender, and Cohort Fertility in the Nordic Countries. *European Journal of Population*.

Kneale, D., & Joshi, H. (2008). Postponement and childlessness - evidence from two British cohorts. *Demographic Research, 19*(58), 1935-1968.

Kravdal, Ø., & Rindfuss, R. R. (2008). Changing relationships between education and fertility: A study of women and men born 1940 to 1964. *American Sociological Review, 73*(5), 854-873.

Lappegård, T. and M. Rønsen (2013). Socioeconomic differentials in multi-partner fertility among fathers. *Demography* 50(3), 1135-1153.

Miettinen, A., Rotkirch, A., Szalma, I., Donno, A., and Tanturri, M.-L. (2015). *Increasing childlessness in Europe: Time trends and country differences.* Families and Societies Working Paper 33.

Neyer, G., Lappegård, T., and Vignoli, D. (2013). Gender equality and fertility: Which equality matters? *European Journal of Population, 29*(3), 245–272.

Nisén, J., Martikainen, P., Myrskylä, M., and Silventoinen, K. (2017). Education, other socioeconomic characteristics across the life course, and fertility among Finnish men. *European Journal of Population*.

Nisén, J., Martikainen, P., Silventoinen, K., and Myrskylä, M. (2014). Age- specific fertility by educational level in the Finnish male cohort born 1940–1950. *Demographic Research, 31*(5), 119–136.

NUTS 2010/EU-27. (2011 ed.). Luxemburg: European Union.

OECD. (2015). *ISCED 2011 Operational Manual. Guidelines for classifying national education programmes and related qualifications*. European Union: OECD Publishing.

Rallu, J.-L., & Toulemon, L. (1994). Period fertility measures: The construction of different indices and their application to France, 1946-89. *Population an English Selection*, 59-93.

Sobotka, T. (2017). Childlessness in Europe: Reconstructing long-term trends among women born in 1900–1972. In M. Kreyenfeld and D. Konietzka (Eds.), *Childlessness in Europe: Contexts, causes, and consequences* (pp. 17–53). Berlin: Springer.

Tanturri, M.-L., Mills, M., Rotkirch, A., Sobotka, T., Takács, J., Miettinen, A., et al. (2015). *Childlessness in Europe. State-of-the-art report*. Families and Societies Working Paper 32.

Toulemon, L., & Lapierre-Adamcyk, É. (2000). Demographic Patterns of Motherhood and Fatherhood in France. In C. Bledsoe, S. Lerner, & J. I. Guyer (Eds.), *Fertility and the Male Life-Cycle in the Era of Fertility Decline* (pp. 293-330). New York: Oxford University Press Inc.

Trimarchi, A., and van Bavel, J. (2017). Education and the transition to fatherhood in Europe: The role of selection into union. *Demography, 54*(1), 119–144.

van Bavel, J. The reversal of gender inequality in education, union formation and fertility in Europe. *Vienna Yearbook of Population Research* (2012): 127-154.

Wood, J., Neels, K., and Kil, T. (2014). The educational gradient of childlessness and cohort parity progression in 14 low fertility countries. *Demographic Research, 31*(46), 1365–1415.

Wood, J., Klüsener, S., Neels, K., & Myrskylä, M. (2017). *Is a positive link between human development and fertility attainable? Insights from the Belgian vanguard case*. MPIDR Working Paper WP 2017-014.