Social class and the quantum and tempo effect of fertility during fertility decline

(Extended abstract)

Introduction

Previous research has identified pronounced social class differences in fertility during the demographic transition. Upper- and middle-class women reduced their fertility earlier than farmers and lower-class women. This research has either been based on census data on number of children present in the household, children ever born, or duration analysis of birth intervals. A well-known limitation with the latter analysis is the inability to distinguish between quantum and tempo of childbearing, or the spacing and stopping in relation to the transition. Recently cure models have been implemented in demography to make this distinction. They allow separate estimations of the risk of having another child, from the timing to that event. In this paper, we apply cure models to study class differences in marital fertility during the Swedish fertility transition. The analysis is made on a regional sample of birth histories with detailed information on occupation.

The fertility transition and role of socioeconomic status

One of the major demographic changes during the past 200 years has been the emergence of the two-child norm as part of the creation of the modern family. In most parts of Western Europe this process started in the late nineteenth century and was completed by the 1930s. Despite its importance, demographers still lack a clear understanding of the crucial mechanisms behind this process (see, e.g., Guinnane 2011). Crucial to understanding the fertility decline are the differences in fertility according to socio-economic status (SES) and how they evolved over the fertility transition (Dribe et al. 2017). There is a widespread view in the literature that higher social status was associated with high fertility in pre-transitional populations, but that this situation reversed during, or even well before, the transition began (e.g., Skirbekk 2008). This change has been explained by the higher social groups acting as forerunners to the decline (Dribe et al. 2017). These generalizations are based on census data on number of children present in the household, children ever born, or survival analysis of birth intervals. A well-known limitation with the latter analysis is the inability to distinguish between quantum and tempo of childbearing, or the spacing and stopping in relation to the fertility decline.

Spacing and stopping

During the early phases of the fertility decline, couples who have started to reproduce and subsequently want to limit their fertility can follow two strategies: birth spacing or stopping. Spacing consists of increasing the intervals between successive births, while the stopping strategy attempts to prevent further reproduction after the maximum desired number of children has been reached (Van Bavel 2004). Some scholars accepted that stopping has played the major role in the European historical fertility decline as couples began to stop having children after reaching a certain target family size (e.g., Coale and Watkins 1986). On the contrary, other researchers believe that birth spacing, and not only stopping, was an important component in explaining the fertility transition (e.g. Anderson 1998; Bengtsson and Ohlsson 1994; Szreter 1996). One of the problems impeding this debate has been lack of agreement about a way to measure birth spacing. In these terms, this article aims to study the differential by SES (socioeconomic status) in spacing and stopping behaviors adopting a new way of looking for evidence of fertility transitions.

Distinguishing quantum and tempo effects in fertility analysis

Analyses based on survival models have a long tradition in fertility studies from contemporary and historical sources, as they represent a bridge between the classical life table methods and modern regression techniques. The most commonly used models in fertility research, are the proportional hazard specifications, such as the Cox model. Although they are adequate for handling censored observations,

these models have a serious shortcoming (Bremhorst, Kreyenfeld and Lambert 2016): it often happens that a fraction of subjects will never experience the event of interest (birth, in this case). These subjects are usually considered as having infinite survival times. To get around this shortcoming, classical survival models have been extended to what are commonly referred to as Cure models. These models borrow the name from their natural area of medical applications, where one is interested in the time until recurrence of a certain disease (Amico and Van Keilegom 2018, Lambert 2007). In medical studies, some patients will never suffer a relapse of a given disease and are hence cured of their disease. At the same way, in fertility studies some couples will stop childbearing after reaching a certain family size. While the standard survival models cannot differentiate between timing and quantum often producing misleading results, the Cure models allow separate estimations of the risk of having another child, from the timing to that event, as they acknowledge explicitly that an unknown proportion of the population studied will never experience the event of interest (Yamaguchi 1995).
Recently, Cure survival models are more and more frequently used in epidemiological studies. Nevertheless, these models are, surprisingly, rarely applied in fertility analysis (Alter, Oris, and Tyurin 2007).

The Cure model application
Considering different birth parity, we will use Cure models to predict the proportion of women who will stop having childbearing and to estimate the relative risks of having another birth. The two parts of the cure model correspond to the behaviors of stopping ("cure fraction") and spacing in fertility analysis. On the one hand, the "Spacing model" includes the socioeconomic status (SES) as the main covariate, also controlling for the mother's age, measures of active breastfeeding and duration of marriage and year of observation. On the other hand, the "Stopping model" includes the previous covariates and a further bio-demographic control for the sex composition of the surviving children. We also divide the period of analysis into four distinct periods corresponding to the different phases of the fertility transition: 1815-1879 (pre-transitional), 1880-1904 (early transition), 1905-1919 (mid transition), and 1920-1939 (late transition). Socioeconomic status is measured by the occupation of the family head (the husband).

Area and data
Using longitudinal individual-level data from the Scanian Economic-Demographic Database, we focus on a changing community in southern Sweden, which has developed from being a rural area to a mix of rural areas and a small town. The study covers the period 1815-1939, which encompasses the entire fertility transition, as well as a pre-transitional period of about 60 years.
The area is located about ten kilometers from the coast in the western parts of Scania, which is the southernmost province of Sweden. The five parishes we studied had 3,900 inhabitants in 1830. By the end of 1939 that figure had increased to 6,300. Fertility was slightly higher than in Sweden as a whole but followed the same patterns over time. This area underwent fundamental changes in economic structure from the mid-nineteenth century onwards. The manufacturing industry grew rapidly and the agricultural sector was rationalized. After about 1900 the service sector started to grow as well.
It was not until 1882 that school attendance became mandatory. However, even after it became mandatory, many families, especially in rural areas where child labor was not abandoned until 1936 (1944 for homework) did not send their children to school as much as they were obliged too.

The Scanian Economic-Demographic Database, contains demographic as well as socioeconomic information, including occupation, landholding, and income. The sources of the Scanian database are local population registers in combination with church records for five parishes, which include information on demographic events and migration for all members of households, and families within households. In this paper we use data from about 1815, when the population registers begin, to 1939, when the fertility transition in Sweden was completed and a period of increasing fertility was about to begin (the baby boom). The data from the population registers have also been linked to poll-tax registers (mantalslängder) and income registers which provide yearly information on occupation. The resulting database contains all individuals born in the different parishes, or migrating into them (Bengtsson and Dribe 2014).

Expected results

Previous research has identified pronounced social class differences in fertility during the demographic transition. Upper- and middle-class women reduced their fertility earlier than farmers and lower-class women. Using these rich data sources enabled analysis of the relationship between SES and the two spacing and stopping strategy and how this relation evolved during the fertility decline. From previous analysis focus on Sweden that were carried out by using other more traditional methods, we should expect that the fertility decline was not solely a matter of stopping but more of a reduction in births over the entire reproductive period (Bengtsson and Ohlsson 1994; Dribe 2009). In these terms, we expect that the fertility transition involved not only parity-specific stopping but also spacing and that different social classes may also show evident differences in the propensity to stopping or spacing behaviors.

Main References

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