Low Fertility and the Reversal of Gender Inequality in Education in Europe: Theory and Hypotheses

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Abstract
While men have always received more education than women in the past, this gender imbalance in education has now turned around. For the first time in European history, there are more highly educated women than men reaching the reproductive ages and looking for a partner. I expect that this will have profound consequences for the demography of reproduction because mating practices have always implied that men are the majority in higher education. These traditional practices are no longer compatible with the new gender distribution in education. The objective of this paper is to formulate hypotheses about the consequences for reproductive behaviour in Europe. I expect the following causal chain between the reversal of the gender imbalance in education (RGIE) and fertility: RGIE creates a new, education specific mating squeeze that affects the process and expected pattern of assortative mating, which in turns affects the timing, probability, and stability of union formation, which eventually is expected to have implications for fertility. Each of the links in this chain are discussed in detail.

Outline/abstract
A major social development of the second half of the twentieth century has been the spectacular increase of participation in higher education in general, and participation by women in particular. In North America and Europe today, women excel men in terms of participation and success in higher education. Yet, research on the demographic consequences of the reversal of gender inequality in higher education is rare, even if education, and especially women's level of education, has proven to be relevant for all kinds of demographic behaviour.

The aim of this paper is to stimulate future empirical research about this issue in European countries. To this end, it reviews the literature to derive specific hypotheses about the potential implications of the reversal of gender inequality in higher education (abbreviated as RGIE from now on) for union formation and fertility in Europe. The underlying general hypothesis is that RGIE will have profound consequences for long-standing patterns of reproduction.

We already know that the expansion of higher education, especially among women, has led to a major postponement of the age at entry into parenthood. This effect is direct and approximately unidirectional, with few countervailing mechanisms. In contrast, I expect that RGIE will generate new indirect effects via its implications for partnership formation and dissolution. The potential indirect effects are not unidirectional. It is not just a further compositional shift towards even more highly educated women entering the dating and mating market. Rather, I argue that the turnaround of the gender imbalance from a male toward a female majority in higher education will have non-monotonic implications, with countervailing mechanisms and uncertain outcomes.

The first section of the paper will briefly sketch the contours of RGIE in Europe. Then, I argue that we need to update the concept of the “marriage squeeze” in order to address the implications. The subsequent section discusses the potential implications for the pattern of educational assortative mating. Following Oppenheimer’s theory of marriage timing, I argue that
the degree of difficulty that people encounter to mate assortatively will have implications for the timing and probability of union formation, as well as for the stability of unions. Further down the road, the timing, probability, and stability of unions will affect fertility. The major section of the paper speculates about these fertility implications. The conclusion gives an overview of all hypotheses formulated along the way.

**Updating the concept of the marriage squeeze**

A long-standing theory in family demography holds that marriage rates for both men and women are affected by the number of suitable marriage partners available in the local marriage market. In its most basic form, the "marriage squeeze" hypothesis holds that marriage prospects are lower if the number of unmarried persons of the desired age is low. In the Western world, unmarried women are argued to suffer a marriage squeeze if the number of unmarried men who are around 2 years older is lower than their own number, because the age gap between husband and wife is usually around 2 years in the West (Crowder & Tolnay 2000).

A first useful step to investigate the implications of the reversed gender imbalance in higher education is to determine the dimensions of the marriage squeeze in ways that are relevant for partnership and family formation today. This entails at least two things. First, given the increasing importance of unmarried cohabitation and given the fact that a growing proportion of children are born outside marriage in Europe (Sobotka and Toulemon 2008), the concept and idea of the marriage squeeze should be broadened to include the effects of age specific sex ratio imbalances on the mating market rather than on the marriage market only. For the same reason, when I use the concept of homogamy in this paper, it is meant to refer to the pattern of assortative mating in unmarried cohabitation as well as in marriage. Second, and crucial for this paper, education should be added to the dimensions of age and sex to quantify the mating squeeze in a more meaningful way. The expansion of higher education among women implies that women who want to find a male partner with the same or a higher level of educational attainment would increasingly suffer an education-specific mating squeeze.

The concept of the marriage squeeze is particularly useful when seeking to explain changes that are opposite for men versus women (Oppenheimer 1988: 564). For example, when women suffer a marriage squeeze for a lack of suitable partners, the implication is that men would enjoy an abundant “supply” of potential partners. This may trigger potentially opposite changes for men and women. Or, from the perspective of couples rather than individual men and women, since a heterosexual match involves both a man and a woman, a shifting mating squeeze may have non-monotonic effects, for example on the pattern of assortative mating, on family size, or on the risk of union dissolution.

Ideally, measuring the extent of marriage squeeze entails reconstructing sex ratios by level of education at the reproductive ages for singles only. The required data to do this are not available right away for a large number of countries. However, as a first approximation, yearly sex ratios at the reproductive ages by level of education can be calculated based on the IIASA/VID education specific population projections (Lutz et al. 2007; KC et al. 2008). Figure 1 plots yearly sex ratios at age 25 to 29 years for young adult men and women with a degree in tertiary education, covering the period 1970-2010 (figures beyond 2000 are based on the GET-scenario, see KC et al. 2008; yearly figures are linearly interpolated from five-yearly figures).
Countries that exhibited the most strongly skewed sex ratios for the highly educated back in the 1970s are in the top row of the figure. With sex ratios of 2.0 and higher in Belgium, Spain, Germany, Austria, and Switzerland, highly educated men very clearly outnumbered highly educated women on the mating market in 1970; in Switzerland, for instance, there were over 280 highly educated men for each 100 highly educated women of age 25 to 29 years. In most countries, the sex ratio was much lower. In Hungary as well as in the USA, for example, there were “only” 140 highly educated men for each group of 100 highly educated women. In France and Denmark, this number stood at 120, in Italy at 133. According to these figures, there was already a female majority among 25-29 years old people with a tertiary degree in a surprisingly high number of countries. These countries tend to be situated in post-communist Eastern Europe as well as in Northern Europe.
The big general trend between 1970 and 2010 is one of declining sex ratios among the highly educated, such that by 2010, in all but one country (namely Switzerland), the sex ratio was below 1. In countries that already had a low sex ratio in 1970, the decline tends to be more limited or even absent (like in Sweden); in countries with a high sex ratio, the decline tends to be more dramatic. In most cases, the decline was more or less monotonic, but there are a conspicuously large number of cases where the sex ratio went up for a couple of years after a previously declining trend (see the US, Slovakia, the Netherlands, Latvia, Romania, Poland and Norway). In all cases, this happened when the sex ratio was already below the threshold of gender parity, so when women were already in the majority among young adult graduates. And in all cases, the declining trends towards an even stronger majority of women continued afterwards.

**Implications of education specific mating squeeze**

It will be highly important to investigate the origins of these national variations in the general trend towards an ever stronger majority of women with a degree in tertiary education. To the extent that they represent twists and turns that are exogenous with respect to reproductive behaviour, these variations provide statistical leverage for investigating the causal effect of the education-specific mating squeeze on reproductive behaviour. In order to address this issue, it will also be important to reconstruct sex ratios for singles. Sex ratios for singles are expected to be even more skewed than the ones presented here (Guttentag and Second 1983: 16-19). Sex ratios for singles are directly affected by mating and schooling behaviour, and they are hypothesised to affect such behaviour in turn. The rest of the paper will discuss potential implications of education specific mating squeeze for reproductive behaviour. Figure 2 depicts the causal pathway that is assumed to be relevant and that is used to organize the discussion. First, RGIE and the ensuing mating squeeze is expected to affect patterns of assortative mating. Next, the degree of difficulty that men and women encounter in mating assortatively, is hypothesized to affect the probability, timing, and stability of union formation. These trends and differentials are in turn expected to affect fertility.

**Figure 2. Hypothesized implications of the shifting gender imbalance in education for reproductive behaviour**

![Diagram](image)

**References**


