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RESEARCH NOTE

Male fertility in the 19th century: the case of the Moscow merchant class

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Abstract

The article presents estimates of male fertility among the Moscow merchants in 1850-1858: it assesses the impact of specific marital behavior of male merchants on fertility rates, defines the limits of the male reproductive age, and considers the contribution of infant and child mortality to the formation of family structure. *Skazki* (household lists) of the 10th revision of the Moscow merchants served the data source. The analysis showed that late marriage with low definitive celibacy of the Moscow male merchants and a significant age difference between spouses is combined with relatively high rates of male fertility at the age of over 50. The total fertility rate for the period under study exceeds five children per man.

Keywords

population revisions, male fertility, definitive celibacy, singulate mean age at marriage, own-children method, infant mortality, child mortality

JEL codes: J12, J13, N33, N93

Introduction

In this note the authors use the terms «fertility» and «male fertility», as it has been commonly used since the mid-1970s in the Russian-language demographic literature, although we are actually referring to the concept and indicators of «fecundity» (in particular male fecundity) as they are defined in world practice of demographic analysis. Initially, in the Russian-language demographic literature as well as in general practice, fertility defined births (number of births) as a component of population movement, while fecundity linked births to the life cycle of parents' generation. These definitions are found in all classic textbooks

on population statistics (see, for example, Whipple, Novoselsky 1929: 465, 469-472; Demography Course 1974: 53, 90-97). The confusion of terminology began after the publication of V. A. Borisov's book «Prospects of Fertility» (Borisov 1976); in 1984, the confusion of these different theoretical concepts was enshrined in the Demographic Encyclopedic Dictionary in the article «Fertility» by L.E.Darsky (Darsky 1984: 373-376). Discussion of causes and consequences of this terminological confusion is outside the scope and purpose of this publication. Therefore, with due respect for the current rules of the Russian-language demography, the authors will use the term «male fertility», reserving the right to further criticize terminological inconsistencies.

In contemporary Russian literature, male reproductive behaviour in general and male fertility in particular are usually referred to in the following two ways:

- Reproductive health/infertility
- Reproductive plans and attitudes, fertility intentions, couples' reproductive decision-making and the use of contraception to achieve them.

Although Rosstat (Russian Federal State Statistics Service) develops information on the distribution of births by fathers' age (though without publishing it in demographic yearbooks), traditionally, fertility has been studied based on indicators for the female population.

There are few exceptions; in recent years, one can name isolated works analyzing male fertility. The article by S.Zakharov and S.Surkov (2009) uses the RiDMiZh[1] survey data to analyze migration histories of the Russians and the relationship between the first birth and male migration activity. In a recent paper by V.Arkhangel'skii and O.Kalachikova (2021), the authors, using unpublished Rosstat data on the distribution of births by father's age, analyze the impact of the type of partnership on male fertility rates and propose a methodology to adjust data on father's age at birth.

The list of foreign studies on male fertility is more extensive and more «demographic». First, it is the monograph "Fertility and the male life cycle in the era of fertility decline" (2000) covering a wide range of topics: demography, anthropology, genetics and other aspects of male fertility. However, the fact that D.Coleman is the author of the first chapter of this monograph, in some ways, gives priority to demographic aspects in the study on male fertility.

A number of works analyze classic fertility indicators, but in relation to men. This direction was developed in the 2010s, after the publication of L. Zhang's monograph (Zhang 2011). It was followed by publications on male fertility in Greece (Tragaki and Bagavos 2014), Denmark (Nordfalk et al. 2015), Germany (Dudel and Klüsener 2016). B. Schoumaker (2017) analyses male fertility rates in a number of developing countries based on data from the Demographic and Health Survey.

The U.S. Men's Fertility and Fatherhood Report, released in 2019, for the first time ever provided estimates of male fertility rates based on the full reproductive histories of male respondents to the 2014 Income and Program Participation Survey (Monte, Knop 2019: 1).

There are hardly any works on male fertility in the past. One can name only B.Anderson's retrospective study on the influence of paternal age on fertility rates in Ireland based on the 1911 census (Anderson 1975) and the publication of N.Brouard, who has recovered a series of age-specific rates of male fertility in France for the period 1899-1974 and completed fertility in male cohorts born in 1880-1930 (Brouard 1977).

Nevertheless, the study on male fertility is crucial to understanding the history of everyday life and social history in general. Indeed, how can we understand inheritance rules and

1 Parents and Children, Men and Women in Family and Society, Wave 2 (2007).

intergenerational relations in patrilineal and patriarchal societies without linking childbearing to the life cycle of the male head of the family and the family group? To what extent do intra-family conflicts, father-child conflicts that have been inspiring writers and poets from the antiquity to present day, depend on the age at which a man becomes the father of each of his children?

Russian historical sources, in particular *revizskie skazki*[1] (household lists), make it possible to estimate male fertility from the middle of the 18th to the middle of the 19th century. In reality, this period is much shorter; this is due to the safekeeping and integrity as well as availability of unpublished archival documents.

In this article, the authors will present an assessment of the male fertility rates among the Moscow merchants in the mid-19th century, based on population revisions.

Sources and methods

The sources of information in this study are the *skazki* of the Moscow merchants of the 9th (1850) and 10th (1857-1858) revisions. The advantage of this source is a relative ease of information gathering, as the *skazki* for all revisions are published and their copies are available.[2]

Skazki of the Moscow merchant households contain the following information:

- age (at the time of the current and previous revision for men and only at the time of the current revision for women);
- marital status of each individual aged 15 and over;
- kin relationship between each household member and the household head or some other member of the household;
- year and the reason for inclusion in the *skazki* (birth, arrival to Moscow, entering the merchant class);
- year and the reason for exclusion from the *skazki* (death, departure from Moscow, leaving the merchant class).

The data contained in the *skazki* make it possible to estimate the fertility indicators for the inter-revision period by the «own-children method» [Indirect techniques..., 1983: 182-195].

Steps for implementing the method (in relation to fathers):

1. Link children born between the two revisions and included in the current revision to their fathers.
2. Identify the age of the father at the time of birth of each child.
3. Distribute children for whom fathers have not been identified by male age groups according to the distribution of children for whom fathers have been identified.
4. Adjust for mortality of children born and died within the inter-revision interval to refine the numerator in calculating the birth rates.
5. Adjust for male mortality in the inter-revision period to refine the denominator in calculating the birth rates.

In case of using *skazki*, step 5 of the standard procedure becomes irrelevant, as deaths of men between revisions are recorded in the *skazki* with the year of death. In this case, the

1 Census-like household lists compiled in Russia in 1719-1858 and mainly covered the taxable population. For more details see (Blum, Troitskaya 1997: 124-129).

2 On the history of publishing the Moscow merchant revisions, see: [Ulyanova, 2018].

denominator in the age-specific fertility rates can be calculated quite accurately. Note that for calculating female fertility rates, step 5 would have been mandatory because information on deaths of women in the inter-revision period is not registered in the *skazki*.

Male fertility rates will be calculated based on a sample of 3,696 children born in the Moscow merchant families after the 9th revision and survived until the 10th revision, and 4,403 men – potential fathers – aged 18 to 70, who lived between the 9th and 10th revisions and survived until the 10th one (Fig. 1).

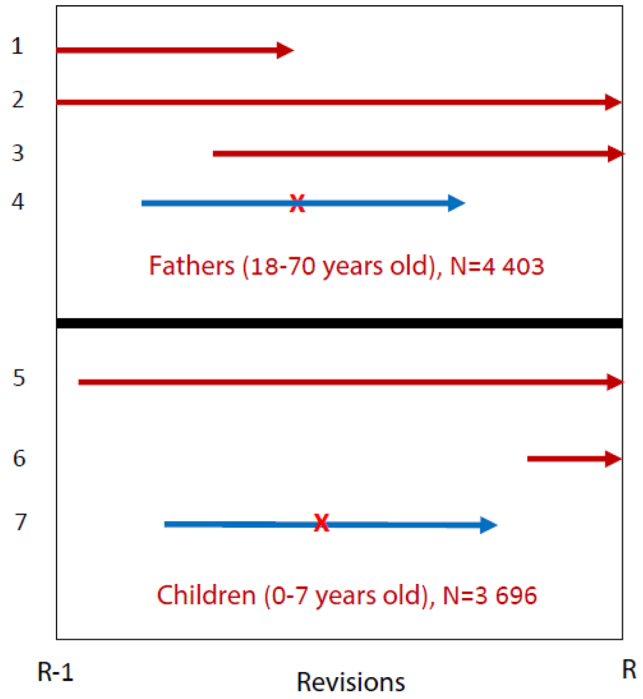

Fig. 1. Lifeline options for fathers and children in the inter-revision period. *Notes*: R-1, previous revision; R, current revision. *Lifelines of fathers*: 1 – recorded in the previous revision, but left before the current one; 2 – recorded in both the previous and the current revision; 3 – not recorded in the previous revision, but recorded in the current one; 4 – not recorded neither in the previous, nor in the current revision (for these people the *skazki* register date of arrival and departure, but there are no data on age). *Lifelines of children*: 5, 6 – born after the previous revision and survived until the beginning of the current one; 7 – born after the previous revision and not survived until the beginning of the current one.

Fathers matching lifeline 4 are considered unidentified, although it is possible to attribute some of them to their children; in that case, the children will be allocated to the fathers' age groups in proportion to those indicators observed in the group of children for whom the fathers are identified (see step 3 in the description of the own-child method).

The *skazki* don't provide any information about children matching lifeline 7; in this case when calculating fertility rates, it will be necessary to make an adjustment for the mortality of children aged 0 to ***n-1***, where ***n*** is the length of the period between the revisions (see step 4 in the description of the own-child method).

Factors affecting fertility of male merchants

a) Marital behaviour

According to B. Anderson, male fertility has been studied much less than female fertility, also because in most populations the difference in age of spouses takes values within a small interval. Therefore, analysis of age-specific coefficients for women is sufficient to study fertility; men's indicators will then be close to them (Anderson, 1975: 561). Of course, such a conclusion is rather true for historical populations which do not know a wide spread of nonmarital births.

The case of the Moscow merchant class does not quite fit in this hypothesis because of the specific matrimonial behaviour of male merchants. First of all, the Moscow merchants enter into their first marriage much later than women belonging to the same social class (Table 1 and Figure 2).

Table 1. Assessment of nuptiality parameters (first marriages) of men and women of the merchant class in Moscow in 1850-1857

Indicator	Females	Males
Mean age at marriage*	21.4	28.7
Median age at marriage	19	27
«Definitive celibacy»**	10%	10%
Age at the end of «marital season»	30	40

Source: Authors' calculations based on revision data.
* – calculation according to the J. Hajnal method (SMAM)
** – share of never-married persons aged 50 years.

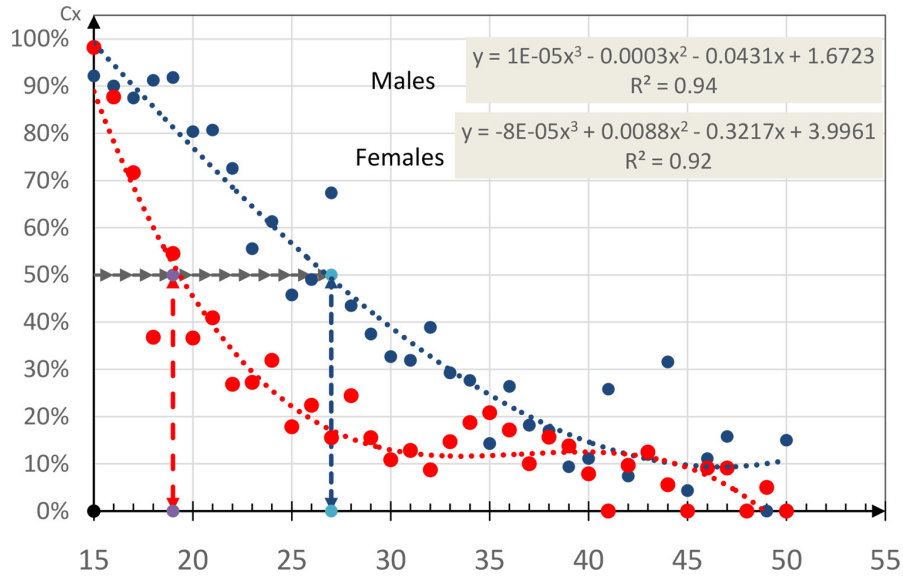

Fig. 2. Shares of never married among the Moscow merchants, by sex and age, 1850-1857. *Source:* Authors' calculations based on revision data.

In Moscow, male merchants began to get married much later than their female peers. By the age of 20 almost 50% of women and only 20% of men were married, while at the age of 25 the figures equaled to 80 and 55%, respectively. In contrast, the relationship between age and the share of never-married men is almost linear, meaning that for men the probability of first marriage is about the same at every age between 15 and 40. The share of never-married persons reaches a minimum and stabilizes for women by the age of 30 and for men only by the age of 40. The rates of definitive celibacy for men and women are quite similar, at around 10%.

Such marital behaviour is not typical, for example, of the peasant class. A comparison of the rates of men's first marriages among the peasant population of the Vykhino estate and the Moscow merchants, carried out using the Coale-McNeil marriage model (Coale, McNeil 1972), shows significant differences in the rate of first marriage: for peasant men it is high – significantly above the model standard[1], whereas the merchants enter into first marriage much slower (Fig. 3).

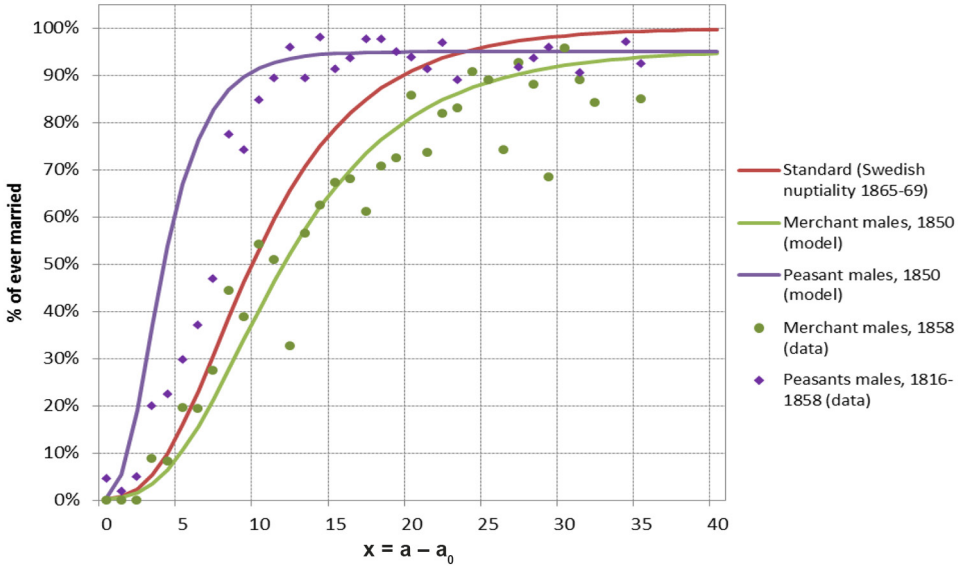

Fig. 3. Differences in the rates of first marriage among male peasants and merchants: estimates using the Coale-McNeil model. *Source*: Authors' calculations based on revision data. *Note*: a_0 – initial age at first marriage (equal to the age by which 1% of the population is married); a – age at first marriage

b) Difference in the age of spouses

In the merchant population of Moscow, a significant difference in the age of the bride and groom is characteristic of couples getting married for the first time (Table 2).

In view of such an age difference it is hardly possible to consider the postponement of first marriages by male merchants as a way of reducing the number of children in the family due to shorter length of the reproductive period (Malthus 1798), because their wives were much younger and entered into their first marriage while in their most active reproductive ages.

1 The Coale-McNeil model uses the marriage rates observed in Sweden between 1865 and 1869 as the standard for the cumulative frequency of first marriages.

Table 2. Difference in the age of spouses in first marriage among the Moscow merchants, 1850-1857

Age differences between spouses, first marriages	N	%
Wife older than husband	110	4.6%
Husband and wife are of the same age	177	7.3%
Husband is older by:		
1-4 years	859	35.6%
5-9 years	685	28.4%
10-14 years	372	15.4%
15 years and over	211	8.7%
Number of couples	**2414**	**100%**
Average age difference between spouses, years	**5.99 ± 5.50**	

Source: Authors' calculations based on revision data.

It should be noted here that in remarriage of men belonging to the Moscow merchant class, the age difference between the spouses becomes even greater.

Results

a) Age-specific and total fertility rates

In calculating the age-specific fertility rates, a correction for deaths of children aged 0-7 in the inter-revision period was made using the East model of the Coale-Demeny life tables, which best fit the mortality patterns in Russia in the mid-19th century (Blum, Troitskaya 1997: 135-137).

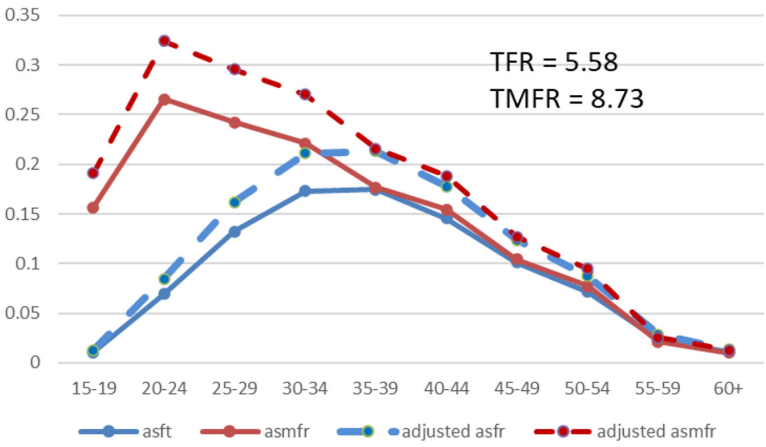

Fig. 4. Age-specific fertility rates and age-specific marital fertility rates among the Moscow merchant males, 1850-1858. *Notes*: dotted line – age-specific rates adjusted for mortality of children aged 0-7; total fertility rate (TFR) and total marital fertility rate (TMFR) calculated by adjusting for mortality of children aged 0-7

The peak of the age-specific male fertility is between the ages of 35 and 39. The differences in age-specific fertility and marital fertility rates practically disappear by the age of 40, when the share of unmarried men stabilizes at a minimum (see Figure 2).

b) The physiological limits of male fertility

The data analysis showed that the reproductive period of men is longer than that of women. Fathers aged 50 and over account for about 7% of all births, whereas for women 50 years are considered to be the physiological limit of fertility.

The maximum age of paternity recorded in the 10th revision (2 cases):

1. Pavel Ivanovich Lafon, married for the second time, his wife aged 38 (according to the 10th revision). He's got four children aged from 1 to 7 from his wife and four more illegitimate children aged from 7 to 16. The last child was born when he was 71 years old.
2. Filat Matveyevich Matveyev, married for the second time, his wife aged 37 (according to the 10th revision). He's got seven children aged from 1 to 15 from his wife. The youngest one was born when his father was 71 years old.

Conclusions

The study on male fertility based on population revisions provides yet more proof for quality of this source and its possibilities: the *skazki* make it possible to apply the most modern methods of demographic analysis to individual data.

It is still too early to tell whether the matrimonial behaviour of the Moscow merchants in the mid-19th century represents a transitional form from the traditional to the modern. But what can be said now is that the demographic situation to the east of the Hajnal line was not as homogeneous as previously believed. But one can hardly consider the postponement of marriages by male merchants as a way of intra-family birth control, because the female behaviour remained traditional (early marriages and frequent births).

Certainly, our results are local. And only an expansion of the geographical scope of the Russian historical-demographic research can help.

Further areas of research could include a comparative analysis of male and female fertility, as well as a study on the problem and perception of paternity among the Moscow merchants.

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