Socioeconomic differences in the fertility transition: a micro level study of southern Sweden

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Abstract

The almost complete focus on the aggregate level in previous research on demographic, socioeconomic and cultural determinants of the fertility transition means that we to a large extent not only lack knowledge about the specific mechanisms of the decline, but also its socioeconomic patterns. In this paper we explore socioeconomic fertility differentials in an industrializing community of southern Sweden using longitudinal micro data. We analyze fertility differentials between various socioeconomic groups over time, both in the agrarian sector and in the growing industrial sector. Data comes from the Scanian Demographic Database, which contains micro-level demographic as well as socioeconomic data, including occupations and landholdings. In the analysis we use hazard regressions with shared unobserved heterogeneity at the family level. We show that the fertility transition involved not only parity-specific stopping but also prolonged birth intervals. While the well-off groups had higher fertility prior to the transition, they started to control their fertility earlier and more consistently. As a result the socioeconomic fertility differences first reversed and even widened before they later converged. We also demonstrate the emergence of new fertility behavior in response to child death, in which a deliberate replacement effect becomes dominating. Also in this regard there were pronounced socioeconomic differentials in the transition.

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Introduction

One of the major demographic changes during the last 200 years is the emergence of the two-child norm as part of the creation of the modern family. In Western Europe, this process started in the late nineteenth century. In Sweden, marital fertility started to decline around 1880 and after about 50 years, total fertility had declined to below two children per women. Since then, although fertility have fluctuated widely, completed fertility have remained quite stable around two children per woman, giving empirical support for the two-child ideal of modern families, which is also frequently indicated by studies of fertility preferences (see, e.g. Stanfors 2003).

Although the process of fertility decline in Europe has received considerable attention in demographic research, most of the research has been macro oriented. For this reason, we know a great deal about the timing of the fertility transition in different regions of Europe, but less about details and causes. We know that the decline started about the same time all over Western Europe, including the Nordic countries. We know that it started slightly earlier in Sweden than in its neighboring countries (Bengtsson 1992). We know that it started earlier in urban areas than in rural areas in Finland (Lutz 1987), Norway (Sogner et al. 1984), Denmark (Matthiessen 1985), and Sweden (Carlsson 1966).

The dominating view in historical demography since the days of the European Fertility Project at Princeton University has been that fertility in pre-transitional Europe was not deliberately controlled but 'natural'. In fact, fertility was not considered to have been within "the calculus of conscious choice" (Coale 1973:65), and the main explanation behind the fertility transition was the *innovation* of families to adjust fertility within marriage to economic circumstances (e.g. Coale & Watkins 1986). As a consequence, females stopped child-bearing after having reached a certain target family size; in other words, the control was parity-specific.

Several scholars have questioned the findings of the Princeton Project using regional level data. Richards (1977), in her analysis of 71 German regions found that the economic structure was important in explaining the fertility decline. The findings in later, and more detailed, studies of Germany (Galloway et al. 1994; Brown and Guinnane 2002) also question the results of the Princeton project, as does a study of Norway (Sogner et al. 1984). In Norway, the fertility decline is largely explained by the regional economic structure at the start of the decline. The results of a recent study of Sweden (Dribe 2009), using similar types of county-level data and methods as Galloway et al.

(1994), is much in line with the findings for Germany, stressing the importance of socioeconomic factors when explaining the fertility decline. Studies of Finland (Lutz 1987) and Denmark (Matthiessen 1985), however, supports the findings of the Princeton project.

Scholars have also questioned the conclusions of the Princeton project from another angle and using micro data, emphasizing that families also in pre-transitional Europe deliberately controlled their fertility, even though this often was done in a non-parity-specific way (e.g. Bean et al. 1990; David & Mroz 1989a, 1989b). Newly presented evidence has further supported the conclusion that fertility was deliberately controlled also before the fertility transition (Bengtson & Dribe 2006; Van Bavel 2004). Consequently, the explanations behind the great decline in fertility which took place in the Western world around the turn of the century 1900 have also changed. Scholars emphasizing the existence of deliberate non-parity specific control before the transition are also inclined to stress these factors as important in the decline itself, rather than simply focusing on the invention of parity-specific control (David and Sanderson 1986; Crafts 1989; Haines 1989; Bean et al. 1990; Morgan 1991; Szreter 1996; Anderson 1998).

The purpose of this paper is to use longitudinal micro-level data to further elaborate on the role of economic factors in the fertility transition, as well as on the issue of spacing and stopping. We will do so by analyzing a rural population during the period 1815-1939, a period characterized by modernization of the agricultural sector and industrial growth. This allows us not only to study the fertility decline as such, but also the situation prior to the decline and whether socioeconomic status mattered for family size. There are very few studies of the fertility transition in Europe using longitudinal micro-level data, i.e., actually studying the behavior of individuals, examining for example the importance of social position, or income, for the fertility decision. Some of the Nordic studies of the 1980s where, however, using micro data. Based on genealogies, Pitkänen (1982), for Finland, and Sogner et al. (1984) for Norway, showed that the well-off and educated groups started to control fertility a bit earlier than others. Two recent studies using micro data are the study of the Spanish town Aranjuez by Reher and Sanz-Gimeno (2007) and van Poppel et al. (2009); the latter compare the findings from Spain with a sample from some regions in the Netherlands. In the study of Aranjuez, the conclusions being that fertility was largely limited to offset the improvements in child mortality, and that the notion of ideal family size has always existed, implying that individual families has always been implementing strategies to obtain targeted family size. They also conclude that stopping and spacing strategies were both at work, and that there was a large heterogeneity across social groups. The study by van Poppel et al. only partly supports the conclusions by Reher and Sanz-Gimeno. In the Dutch case, they find, for example, no support for improvement in child survival as a main trigger for fertility decline, which was so important in Aranjuez. It is noticeable that in both cases, and perhaps more so for the Netherlands, the fertility decline is both multiphasic and very divergent. Furthermore, it is noticeable that the data both for the Netherlands and for Aranjuez starts rather late. The pre-transitional period is thus not well covered in these two studies, which means that comparisons between the pre-transitional and the transitional period are not fully possible.

Most explanations of the fertility decline are related to the emergence of the modern society, and directly or indirectly, to falling infant and child mortality. The discrepancy in time between the decline in infant and child mortality and the fall of marital fertility is, however, more than a hundred years in the case of Sweden. Furthermore, the decline in infant mortality meant that only 0.5 more children in the family survived, whereas total marital fertility went down from some six or seven to about two. Thus, the indirect effect can be ruled out in the case of Sweden as in most other countries. The focus has instead been on economic incentives and social opportunities for controlling family size, and to some extent on technical means. The incorporation of fertility decisions into economic models of household behavior (Leibenstein 1957, 1975; Becker 1981) has produced integration with theories on consumption, savings and labor-supply decisions. Two hypotheses have emerged, the “female cost-of-time hypothesis” and the “quantity-quality interaction hypothesis”. While the first emphasizes the increasing costs of childbearing and child rearing for women employed outside the household, the second emphasizes an increased demand for education as a result of a shift in the consumption towards industrial goods, produced by a better educated labor force. This led families to invest more in each child; in other words to substitute quantity for quality (Becker 1981). Other hypotheses again, focus on the development of institutions to reduce risks, etc, while several other theoretical frameworks pay large attention the role of economic factors as well (e.g. Easterlin & Crimmins 1985; Caldwell 1982) others again focus on social and cultural factors, including religion (see, e.g. Derosas & Van Poppel 2006).

The rural area in southern Sweden, which we study in this paper, is homogenous in terms of religion. Almost the entire population belonged to the Lutheran state church. While the cost for education was changing over time, the direct cost of education was the same for all parents, and so were the costs for investments in their children's health. The development of the state pension system from 1913 onwards covered the entire working population already from its start and not only industrial workers. Wealth, however, was very unequally distributed, as was income. Socioeconomic status partly reflect these wealth differences, but also differences in educational investments, demand for household labor, working life conditions, etc. Thus, differences in fertility between socioeconomic groups reflect a range of different causal mechanisms affecting fertility behavior. It is not within the scope of this analysis to discuss possible mechanisms, but to explore the socioeconomic differences in fertility behavior and how it evolved during the fertility transition. In future work we plan to develop and test more specific hypotheses on the determinants of fertility decline using the data presented in this study.

Data and Context

The data used is based on local population registers for three rural parishes: Hög, Kävlinge, and Kågeröd.[1] They are all located about 10 kilometers from the coast of the western parts of Scania, which is the southernmost province of Sweden. In 1830, the three parishes had 2 661 inhabitants. By the end of 1939 that figure had increased to 5 205, which is roughly the same rate of growth as in Sweden as a whole. The growth in the three parishes was, however, very unequally distributed, as 95 percent of took place in Kävlinge, which was transformed from a rural village to a small industrial town with several factories and railroad connections.

Family reconstitutions, accomplished using data for births, marriages and deaths for a period dating from the late seventeenth century up until 1894, have been combined with register data from around 1815 to 1968. The reconstitutions were carried out automatically using a computer program (see Bengtsson & Lundh 1991). They have also been checked manually and linked to other register data; chiefly poll-tax registers (*mantalslängder*) which provide yearly information on landholding, and the catechetical examination registers (*husförhörslängder*) with information on migration and household context. The database contains all individuals born in the different parishes, or migrating into them. Instead of sampling any particular group (a birth cohort for example), each

[1] The data is maintained by the Scanian Demographic Database, which is a collaborative project between the Regional Archives in Lund and the Centre for Economic Demography, Lund University. The source material is described in Reuterswärd and Olsson (1993), and the quality of data is analysed in Bengtsson and Lundh (1991).

individual is followed from birth, or time of arrival to the parish, to death, or migration out of the parish.

The selected parishes are compact in their geographical location, showing the variations that could occur in a peasant society with regard to size, topography, and socioeconomic conditions, and they offer good source material. Life expectancy at birth followed the same development as the entire country, but was about one year higher (Bengtsson & Dribe 1997; Bengtsson 2004). The entire area was open farmland, except for parts of Kågeröd, which were more wooded. Kågeröd was predominantly a noble parish, while freehold and crown land dominated in Kävlinge and Hög. The agricultural sector in Sweden, and Scania, became increasingly commercialized during the early nineteenth century. New crops and techniques were introduced. Enclosure reforms and other reforms in the agricultural sector influenced population growth.

Methods

In the first part of the analysis we chart the fertility transition in the sample of parishes looking at general marital fertility rates (for women aged 15-29), age-specific fertility rates, SES-specific fertility rates, and mean birth intervals over the period from 1815-1939. The rates were calculated for the entire population of married women residing in the parishes. Women are followed from in-migration or marriage, until death, out-migration or turning 50.

We then move to a multivariate analysis mainly aimed to estimate the development of socioeconomic differences in marital fertility in the fertility transition controlling for a basic set of covariates. The goal in this first analysis is not to develop a model including a full set of potential determinants of fertility. The analysis is made separately for first births and higher order births. We use piecewise constant exponential hazard models (see, e.g. Blossfeld et al. 2007) with a shared frailty at the individual (woman) level to account for repeated events for the same woman (in the analysis of higher order births). The frailty factor is assumed to follow a Gaussian distribution, and the time since last birth is the duration variable. We use 3-month time periods for the baseline hazard, which gives a high flexibility, and thus does not impose severe restrictions on the shape of the baseline hazard function (comparisons with the Cox model also showed very similar parameter estimates). We analyze all higher order birth intervals simultaneously instead of analyzing focusing entirely on stopping by, for example, looking only at the third or the fourth birth. This is justified from earlier results indicating that the fertility decline in Sweden is not solely a matter of stopping but more of a reduction of births over the entire reproductive period (Bengtsson & Ohlsson 1994; Dribe 2009, see also Figure 2-4 below).

We start by estimating a basic model, which includes socioeconomic status, life status of the previously born child, time period, age of the woman, and parish of residence. We then estimate an extended model, which includes interactions between socioeconomic status and survival of the previously born child, to detect possible differences between socioeconomic groups in the adoption of new fertility control behavior in relation to child death. All covariates, except place of residence, is time-varying.

Due to the possibility of endogeneity in several of the covariates, we should refrain from drawing causal inferences of these covariates at this stage. However, since the aim here mainly is to study socioeconomic differences, rather than the causal effect of socioeconomic status on fertility, this kind of endogeneity in some of the control variables is not of vital importance.

We have coded all occupations in the database into HISCO (van Leeuwen, Maas & Miles 2002), and then classified them according to HISCLASS (Maas & van Leeuwen 2005; see also Dribe & Lundh 2009).[2] HISCLASS is a 12-category classification scheme based on skill level, degree of supervision, whether manual or non-manual, and whether urban or rural. It is clearly not straightforward to make these kinds of classifications, and it becomes even more complex if the objective is to relate the different groups to concepts such as “class” or “power” (for example, see van de Putte 2006). Despite such concerns, we believe that differentiating the landless group in this largely rural society greatly contributes to an enhanced analysis.

In addition to the occupational information, we also use information on tenure and size of landholding to capture important differences within the farmer category. Because of the rather small sample and rural character of our community, it is not possible to use the full range of the HISCLASS in the analysis. The final classification used is displayed in the table below. Married women are given the status of their husbands since they usually lack an occupation of their own.

[2] The classification into HISCLASS was made using the recode job: hisco_hisclass12a_@.inc, May 2004, see http://historyofwork.iisg.nl/list_pub.php?categories=hisclass

Socioeconomic classification:

SES	*HISCLASS*	*Description*
1. Higher occupations	1-6	higher managers, higher professionals, lower managers, lower professionals, clerical and sales, lower clerical and sales, foremen
2. Farmers	8	1815-1899: ≥1/16 *mantal*[3], Freeholders (SK) and Crown tenants (KR) 1900-1939: All farmers
3. Skilled workers	7	Craftsmen etc.
4. Smallholders	8	<1/16 *mantal*, all tenures, 1815-1899.
5. Lower skilled work-ers	9-10	Crofters, low ranked soldiers, carpenters etc
6. Unskilled workers	11-12	Farm workers, other workers, servants, etc

The distinction between Farmers and Smallholders is relevant mainly in the nineteenth century, and hence all farmers, irrespective of the size of their farm is included in the group Farmers after 1900. The proportion of farmers with at least one child (Table 5 below) went down from 16 to 10 percent, while families headed by persons with higher occupation increased from 6 to 20 percent from the first to the last period. Higher occupations expanded fastest in Kävlinge/Hög, from 7 to 25 percent, showing the dynamic labour market outside of the agricultural sector, which is also indicated by the increase of skilled workers, from 8 to 15 percent. Evidently, Kävlinge/Hög moved into the modern economy faster than Kågeröd, also manifested by a much faster population growth.

Life status of previous child is included to measure the impact of child death on fertility, in other words if child deaths induced parents to compensate by having another birth (replacement). We distinguish between child deaths happening within two years since previous birth, and more than two years since previous birth. A stronger effect within two years from previous birth should be interpreted mainly as an involuntary fertility increasing effect of termination of breastfeeding following the death of the previous child, while similar effects, or a stronger effect more than two years after

[3] *Mantal* is a rough measure of the productive potential of the farm not directly convertible into an areal measure such as acres. 1/16 of a mantal is used as the limit of subsistence, which is also the way contemporary society defined it (for a discussion, see Dribe 2000, chapter 2).

previous births, would indicate a stronger impact of a deliberate replacement effect (see, e.g. Tsuya et al. 2010, Ch 3).

The fertility transition in the Scanian communities

Figure 1 shows the general marital fertility rate (births to married women divided by the person years at risk for married women 15-49 years) annually 1815-1939. It is quite clear that there was not much trend in marital fertility during much of the nineteenth century. During the 1890s fertility suddenly declined, and once the decline started it continued uninterrupted until the mid 1930s. This is basically the same pattern as for Sweden as whole, although the decline started a bit later in the Scanian sample compared to the country as a whole (about 1880, see e.g. Dribe 2009). In figure 2 the fertility rates of two separate age groups are displayed, showing basically the same time pattern in the decline, indicating that it was not only a matter of stopping childbearing after reaching the targeted family size but also about birth spacing, as was also the case for Sweden as a whole (Bengtsson 1992).

Figures 1 and 2 here

Figure 3 pictures the development of age-specific fertility over time. The fertility transition is clearly visible in the graphs, with a lowering of marital fertility in all age groups. It is difficult from only visual inspection to determine if this reduction was due to prolonged birth intervals or parity specific stopping. A common way to indicate stopping has been to use the Coale-Trussel model (Coale & Trussel 1974, 1978).[4] Table 1 reports estimates of the m, and M parameters using the age-specific schedules from figure 3. Values on m over 0.2-0.3 are usually taken to indicate the presence of parity-specific fertility control. By this measure fertility appears to have been controlled in this way at least by the turn of the century, which also accords pretty well with national and regional level data (Dribe 2009).

Figure 3 and Table 1 here

[4]Although there have been numerous criticisms against this way of modeling natural fertility, and although several alternative formulations and estimation techniques have been proposed and presented, it has survived to become widespread, probably because of its simplicity and thus its value for comparisons (see, e.g., Page 1977; Broström 1985; Wilson, Oeppen and Pardoe 1988). Mainly for reasons of comparison the standard formulation devised by Coale and Trussell has been used, by which m is estimated by ordinary least squares regression.

The fact that parity-specific control was one mechanism in the decline should not lead us to rule out the importance of prolonged birth intervals for the decline. As already mentioned, spacing was often important in the transition. As is clear from figure 4 mean previous birth intervals also increased considerably in the fertility decline, pointing to an important role played by this factor too. The long-term increase is most visible for higher order births, where mean intervals increased more than 7 months, from about 2.6 years to 3.2 years. Mean intervals from marriage to first births first decline from about 1.7 to 1.0, and then increased to reach about 1.8 in the final period.

Figure 4 here

While the fertility transition took place over a rather short period of time, say fifty years, it was still a gradual process with limited variation. Explanatory factors, such as urbanization, expansion of schooling and health care, real wages and so on, show similar trends, which makes it difficult to establish causality by looking at time-series data for a single region or country. The focus at this stage of research is therefore to explore fertility differentials between various socioeconomic groups, both in the agrarian sector and in the growing industrial sector.

Figure 5 displays the marital fertility rates (15-49) by socioeconomic status (of the family head). The group Smallholders are not included because they are only in the sample in the first two periods. In the pre-transitional period the series are quite unstable, which at least partly is due to small numbers underlying the rates for some of the groups. It seems as if the decline started among Higher occupations and Farmers, while Skilled workers and Unskilled workers started their decline somewhat later. These kind of aggregated measures are difficult to interpret, however, as socioeconomic differentials might be concealed by compositional effects in terms of age, proportions childless, etc. More specifically, we can also assume that the pattern differed considerably between first births and higher order births, due to differences in frequencies of pre-nuptial pregnancies, or the relation between the marriage decision and the decision to enter into parenthood more generally. Hence, in the analysis we distinguish between the first birth interval (marriage to first birth) and higher order intervals.

If we instead look at the development of mean birth intervals by socioeconomic status in table 2 and 3, all groups exhibited the general pattern of considerable increases in the final period, both for first births and for higher order births. All groups, except unskilled workers also experienced declining first birth intervals between the first and the second periods. The most pronounced changes in first birth intervals we find for Farmers and Higher occupations, while for higher order births the strongest increase was among Skilled workers and Lower skilled workers. Especially the Unskilled workers had very short first birth intervals in the pre-transitional period and early in the transition – about 9 months on average – which clearly points to a high frequency of prenuptial pregnancies in this social group (see Dribe, Manfredini and Oris, forthcoming, for supporting evidence for the area under study).

Figure 5 and Tables 2 and 3 here

Event-history analysis of birth intervals

In order to focus more in depth on the socioeconomic differences in the fertility transition, we move to the multivariate analysis of birth intervals. Table 4 and 5 report means of the covariates used in the hazard models, and Table 6 and 7 display the relative risks from the hazards models, estimated separately for each period and for all periods together. The means of covariates are fairly similar between the two samples, especially when it comes to socioeconomic status. The two exceptions are age-group 15-24 years, with fewer women with at least one child, and parish of residence, which is a result of the more rapid population growth in Kävlinge.

Tables 4-7 here

Looking first at the interval between marriage and first birth in table 6, it is clear that Unskilled workers had higher risks of first birth than other groups in all period except the third, when Skilled workers had higher (the latter effect is not statistically significant). Before the fertility transition (1915-1874), farmers had the lowest first birth risks, followed by Smallholders, and Lower skilled workers. These groups waited longest before having their first birth, while Unskilled workers had their first child soonest after marriage, which was also clear from the birth interval analysis above.

Similarly in the second period, in the early phase of the transition, Unskilled workers, Lower skilled workers, Skilled workers, and Smallholders had higher first birth risks, while the Higher occupations and Farmers had the lowest. In the third and fourth period socioeconomic differences were narrowing, with the possible exception of Higher occupations that had lower first birth risks also in the final period (almost statistically significant with a p-value of 0.07).

Turning to higher order births in table 7, the pattern of the socioeconomic differentials is quite different from that for first births. In the first, pre-transitional, period, Higher occupations and Farmers stand out as groups with higher rates of continued childbearing than the other groups, which indicates a pre-transitional pattern of higher rates of childbearing among the wealthier groups in society (what Clark 2008 famously labeled the "survival of the richest").

In the second period (1875-1899) the Higher occupations had already started to lower their fertility, while all other groups increased their birth risks compared to Unskilled workers. The differences are also statistically significant at the 10 percent level or lower. In the twentieth century socioeconomic differences in birth risks diminished, leaving no statistically significant differences in the final period.

Comparing the pattern for first births and higher order births before the transition, Higher occupations and Farmers had lower first birth risks but higher rates of continued childbearing, while the Unskilled, on the contrary, had higher first birth risks, but lower rates of continued childbearing. Thus, depending on which interval we study, we get a different pattern in terms the ordering of the socioeconomic differentials. What is similar, however, is the widening of the differentials in the first phase of the transition, followed by a convergence later in the transition. Thus, while we cannot find a clear socioeconomic gradient in overall marital fertility before the transition, as was also evident from figure 5 above, there were pronounced socioeconomic differentials in both first birth risks and in continued childbearing. For continued childbearing there is considerable evidence of higher fertility among the more wealthy groups before the transition, but this difference narrowed and almost disappeared as Higher occupations, and to a lesser extent Farmers, acted as forerunners in the decline.

The death of the previously born child had a strong impact on fertility, both before and after the transition. There was, however, an interesting change in the pattern over time. In the first two period the effects of losing a child was much stronger within two years after the birth than later, which could be interpreted as an (unintentional) effect of interrupted breastfeeding following the death of the child, which also removed the contraceptive effect of lactation. In later periods, on the other hand, the two effects first became of similar magnitudes, and then in the final period the effect after two years got considerably stronger. This might reflect changes in breastfeeding patterns, but most likely it mainly indicates the emergence of a deliberate replacement effect. When fertility came under more rigorous control during the transition, the death of a child induced families to replace the deceased child, but did so within a normal birth interval.

Table 8 shows the relative risks of child death by socioeconomic status, estimated from period-specific interaction models. In the first period all groups display the pre-transitional difference in the effects according to time since previous birth. Already in the second period (1874-1899), however, Farmers and Unskilled workers show the new pattern, with equal effects or even a stronger effect after more than two years since previous birth. In the final period this pattern is clearly visible in all groups. Judged by this measure, the Unskilled workers and Farmers were the earliest to adopt this new fertility behavior.

Table 8 here

Conclusion

In this paper we focus special attention on the evolution of socioeconomic differences in fertility in the fertility transition. Due to the lack of micro-level data covering the full period of the fertility transition we still lack a good understanding of the mechanisms of the fertility decline, and we believe that better knowledge of different fertility behavior by socioeconomic status provides new insights into these mechanisms. This is still a highly preliminary, and exploratory, analysis, but nonetheless provides some valuable insights.

First we demonstrate that the fertility transition involved not only parity-specific stopping but also prolonged birth intervals, which has also been highlighted in other Western fertility transitions. Second, we show that the interval between marriage and first birth was shorter for lower socioeconomic strata, implying that the marriage and first birth decisions were tightly interlinked. Turning to second and higher order births, we show that while families of higher occupations and farmers had higher fertility prior to the fertility transition, their fertility declined earlier than in other groups. As a result, the fertility differentials in the first phase of the transition was reversed and widened, which was then followed by convergence so that the socioeconomic differences at the end of the period were very small.

We could also demonstrate the emergence of a new fertility behavior in response to child death, where the previous predominance of an involuntary, fertility increasing, effect of the termination of breastfeeding, gave way to a deliberate replacement of the dead child. There were also clear socioeconomic differences in the adoption of this new behavior, with Farmers and Unskilled workers being the forerunners.

The results presented are mainly explorative, charting the development of socioeconomic fertility behavior in the fertility transition, without discussing much about the causal mechanisms producing this development. In future studies we plan to deepen the analysis of these mechanisms, focusing not only on wealth, but on educational investments and work life conditions of different socioeconomic groups.

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Table 1. Coale-Trussel m and M in the Scanian sample by period.

	M	p-value	m	p-value
1815-1874	1.03	0.787	0.23	0.070
1875-1899	1.00	0.981	0.21	0.002
1900-1914	0.97	0.859	0.63	0.017
1915-1939	0.55	0.002	0.54	0.002

Note: Parameters estimated by OLS.

Table 2. Mean previous birth interval (years) by period and SES.
First births

	1815-1874	1875-1899	1900-1914	1915-1939	1815-1839	N
Higher occ.	1.793	1.067	1.921	2.147	1.831	84
Farmers	1.378	0.977	2.003	2.510	1.743	139
Skilled workers	1.924	0.708	0.627	1.296	1.268	129
Smallholders	2.713	1.907	---	---	2.575	105
Lower skilled workers	1.971	1.185	1.392	1.689	1.767	385
Unskilled workers	0.711	0.763	0.904	1.500	0.918	357
NA	4.746	0.792	1.774	1.842	2.309	50
All	1.739	0.987	1.312	1.762	1.564	
N	635	211	154	249	1249	

Table 3. Mean previous birth interval (years) by period and SES.
Higher order births

	1815-1874	1875-1899	1900-1914	1915-1939	1815-1839	N
Higher occ.	2.336	2.385	2.558	3.122	2.609	573
Farmers	2.635	2.366	2.480	2.965	2.630	842
Skilled workers	2.832	2.247	2.654	3.674	2.830	502
Smallholders	2.586	2.882	---	---	2.627	626
Lower skilled workers	2.655	2.583	2.698	3.450	2.747	1738
Unskilled workers	2.759	2.646	2.631	3.081	2.781	979
NA	2.818	2.272	2.168	2.576	2.478	274
All	2.645	2.527	2.576	3.188	2.701	
N	3016	794	866	858	5534	

Table 4. Means of covariates, interval between marriage and first birth
(based on population risk).

	1815-1939	1815-1874	1875-1899	1900-1914	1915-1939
SES					
Higher occ.	0.099	0.025	0.099	0.113	0.184
Farmers	0.142	0.158	0.117	0.231	0.103
Skilled workers	0.102	0.059	0.095	0.125	0.148
Smallholders	0.085	0.169	0.115	0.190	0.285
Lower skilled workers	0.304	0.382	0.209	---	---
Unskilled workers	0.212	0.150	0.293	0.262	0.239
NA	0.056	0.057	0.072	0.079	0.041
Period					
1815-1874	0.410	---	---	---	---
1875-1899	0.139	---	---	---	---
1900-1914	0.111	---	---	---	---
1915-1939	0.340	---	---	---	---
Age at marriage					
15-24	0.258	0.246	0.180	0.309	0.286
25-29	0.333	0.282	0.377	0.278	0.396
30-34	0.160	0.157	0.158	0.125	0.177
35-39	0.106	0.129	0.155	0.117	0.055
40-49	0.142	0.186	0.131	0.170	0.085
Parish					
Hög/Kävlinge	0.518	0.319	0.459	0.694	0.725
Kågeröd	0.482	0.681	0.541	0.306	0.275
Time at risk	2505	1026	349	278	851

Table 5. Means of covariates, higher order births (based on population at risk).

	1815-1939	1815-1874	1875-1899	1900-1914	1915-1939
SES					
Higher occ.	0.121	0.058	0.108	0.171	0.203
Farmers	0.133	0.160	0.115	0.110	0.109
Skilled workers	0.102	0.065	0.120	0.142	0.131
Smallholders	0.093	0.177	0.112	---	---
Lower skilled workers	0.314	0.382	0.224	0.269	0.270
Unskilled workers	0.183	0.120	0.267	0.217	0.228
NA	0.054	0.038	0.055	0.090	0.059
Period					
1815-1874	0.447	---	---	---	---
1875-1899	0.125	---	---	---	---
1900-1914	0.165	---	---	---	---
1915-1939	0.263	---	---	---	---
Life status of prev. Ch.					
Alive	0.891	0.850	0.889	0.919	0.945
Dead<2y s pb	0.087	0.119	0.082	0.070	0.046
Dead>2y s pb	0.022	0.031	0.029	0.012	0.009
Age of woman					
15-24	0.066	0.057	0.075	0.070	0.074
25-29	0.181	0.167	0.188	0.178	0.205
30-34	0.232	0.221	0.236	0.247	0.239
35-39	0.225	0.221	0.222	0.246	0.219
40-44	0.179	0.194	0.177	0.166	0.164
45-49	0.116	0.139	0.103	0.094	0.099
Parish					
Hög/Kävlinge	0.483	0.360	0.491	0.638	0.592
Kågeröd	0.517	0.640	0.509	0.362	0.408
Time at risk	28231	12629	3535	4650	7416

Table 6. Relative risks of first births from piecewise constant exponential hazard model.

	1815-1939		1815-1874		1875-1899		1900-1914		1915-1939	
	RR	p	RR	p	RR	p	RR	p	RR	p
SES										
Higher occ.	0.705	0.005	0.899	0.618	0.459	0.011	0.872	0.676	0.672	0.074
Farmers	0.595	0.000	0.471	0.000	0.350	0.006	0.896	0.701	0.884	0.559
Skilled workers	0.896	0.293	0.889	0.498	0.882	0.579	1.378	0.239	0.894	0.612
Smallholders	0.685	0.002	0.585	0.000	0.873	0.618	---	---	---	---
Lower skilled workers	0.763	0.000	0.723	0.003	0.844	0.339	1.099	0.692	0.693	0.054
Unskilled workers	1	rc	1	rc	1	rc	1	rc	1	rc
NA	0.602	0.001	0.480	0.026	0.322	0.004	0.974	0.929	0.846	0.580
Period										
1815-1874	1	rc	1	rc	1	rc	1	rc	1	rc
1875-1899	1.043	0.748	---	---	---	---	---	---	---	---
1900-1914	1.064	0.722	---	---	---	---	---	---	---	---
1915-1939	0.703	0.101	---	---	---	---	---	---	---	---
Age ot marriage										
15-24	1	rc	1	rc	1	rc	1	rc	1	rc
25-29	0.873	0.037	1.036	0.699	0.733	0.062	0.875	0.491	0.728	0.031
30-34	0.641	0.000	0.632	0.000	0.598	0.018	0.863	0.563	0.568	0.007
35-39	0.396	0.000	0.300	0.000	0.453	0.004	0.450	0.038	0.705	0.323
40-49	0.113	0.000	0.146	0.000	0.030	0.001	0.103	0.002	0.094	0.001
Parish										
Hög/Kävlinge	1	rc	1	rc	1	rc	1	rc	1	rc
Kågeröd	1.165	0.015	1.024	0.796	1.179	0.252	1.474	0.037	1.388	0.025
Year	0.995	0.053	0.995	0.093	1.000	0.992	0.971	0.121	0.974	0.005
N	1819		840		364		243		433	
Events	1210		607		210		151		242	
Time at risk	2505		1026		349		278		851	
Chisq	777	0.000	368	0.000	75	0.021	51	0.485	273	0.000

Table 7. Relative risks from piecewise constant exponential hazard model. Higher order births.

	1815-1939		1815-1874		1875-1899		1900-1914		1915-1939	
	RR	p	RR	p	RR	p	RR	p	RR	p
SES										
Higher occ.	1.068	0.380	1.632	0.000	1.140	0.471	0.901	0.472	0.971	0.822
Farmers	1.215	0.005	1.230	0.042	1.394	0.059	1.050	0.761	1.198	0.223
Skilled workers	1.007	0.932	1.022	0.872	1.530	0.014	0.973	0.853	0.789	0.128
Smallholders	1.078	0.331	1.074	0.489	1.392	0.058	---	---	---	---
Lower skilled workers	0.963	0.509	0.985	0.866	1.282	0.084	1.038	0.763	0.886	0.328
Unskilled workers	1	rc	1	rc	1	rc	1	rc	1	rc
NA	0.939	0.500	0.631	0.006	0.548	0.016	1.475	0.016	1.136	0.475
Period										
1815-1874	1	rc	---	---	---	---	---	---	---	---
1875-1899	1.315	0.001	---	---	---	---	---	---	---	---
1900-1914	1.109	0.340	---	---	---	---	---	---	---	---
1915-1939	0.612	0.000	---	---	---	---	---	---	---	---
Life status of prev. Ch.										
Alive	1	rc	1	rc	1	rc	1	rc	1	rc
Dead<2y s pb	2.952	0.000	3.840	0.000	3.169	0.000	1.757	0.000	1.556	0.007
Dead>2y s pb	1.524	0.000	1.167	0.131	1.931	0.001	1.963	0.003	3.067	0.000
Age of woman										
15-24	1	rc	1	rc	1	rc	1	rc	1	rc
25-29	0.711	0.000	0.717	0.000	0.850	0.355	0.650	0.004	0.723	0.027
30-34	0.521	0.000	0.481	0.000	0.633	0.012	0.462	0.000	0.668	0.009
35-39	0.364	0.000	0.321	0.000	0.393	0.000	0.385	0.000	0.470	0.000
40-44	0.149	0.000	0.116	0.000	0.149	0.000	0.158	0.000	0.273	0.000
45-49	0.014	0.000	0.008	0.000	0.013	0.000	0.014	0.000	0.055	0.000
Parish										
Hög/Kävlinge	1	rc	1	rc	1	rc	1	rc	1	rc
Kågeröd	1.366	0.000	1.281	0.000	1.381	0.004	1.506	0.000	1.454	0.000
Year	0.993	0.000	0.996	0.063	0.999	0.889	0.951	0.000	0.957	0.000
Frailty variance*	0.649		0.677		0.723		0.363		0.540	
N	8790		4218		1524		1760		2041	
Events	5495		3006		788		864		837	
Time at risk	28231		12629		3535		4650		7416	
Chisq	5726	0.000	2791	0.000	724	0.000	986	0.000	1743	0.000
Chisq(theta=0)	440	0.000	324	0.000	69	0.000	23	0.000	34	0.000

*Gaussian

Table 8. Net effects of life status of previous child by SES.

1815-1874	Dead<2y s prev. birth		Dead>2y s prev. birth	
	RR	p	RR	p
Higher occ.	2.501	0.176	0.615	0.034
Farmers	4.317	0.398	1.234	0.481
Skilled workers	2.846	0.412	0.701	0.118
Smallholders	4.345	0.367	1.154	0.360
Lower skilled workers	4.057	0.529	1.284	0.482
Unskilled workers (rc)	3.619	0.000	1.610	0.088

1875-1899	Dead<2y s prev. birth		Dead>2y s prev. birth	
	RR	p	RR	p
Higher occ.	4.412	0.058	1.751	0.689
Farmers	3.359	0.099	6.123	0.082
Skilled workers	3.558	0.095	1.046	0.700
Smallholders	3.197	0.226	2.113	0.441
Lower skilled workers	4.319	0.021	2.426	0.300
Unskilled workers (rc)	1.724	0.051	1.340	0.367

1900-1914	Dead<2y s prev. birth		Dead>2y s prev. birth	
	RR	p	RR	p
Higher occ.	1.422	0.235	3.050	0.738
Farmers	0.896	0.068	0.845	0.166
Skilled workers	3.381	0.521	1.953	0.810
Smallholders	---	---	---	---
Lower skilled workers	1.420	0.162	1.618	0.492
Unskilled workers (rc)	2.506	0.002	2.405	0.031

1915-1939	Dead<2y s prev. birth		Dead>2y s prev. birth	
	RR	p	RR	p
Higher occ.	1.202	0.060	5.147	0.311
Farmers	1.442	0.189	2.989	0.761
Skilled workers	0.354	0.010	1.460	0.546
Smallholders	---	---	---	---
Lower skilled workers	1.228	0.063	3.673	0.532
Unskilled workers (rc)	2.886	0.000	2.332	0.140

Note: p-values for unskilled workers refer to main effect in regressions, all other p-values refer to interaction effects between SES and life status of previous child.
Model control for the same covariates as Table 7.

Figure 1. General marital fertility rates (15-49) in the Scanian sample 1815-1939.

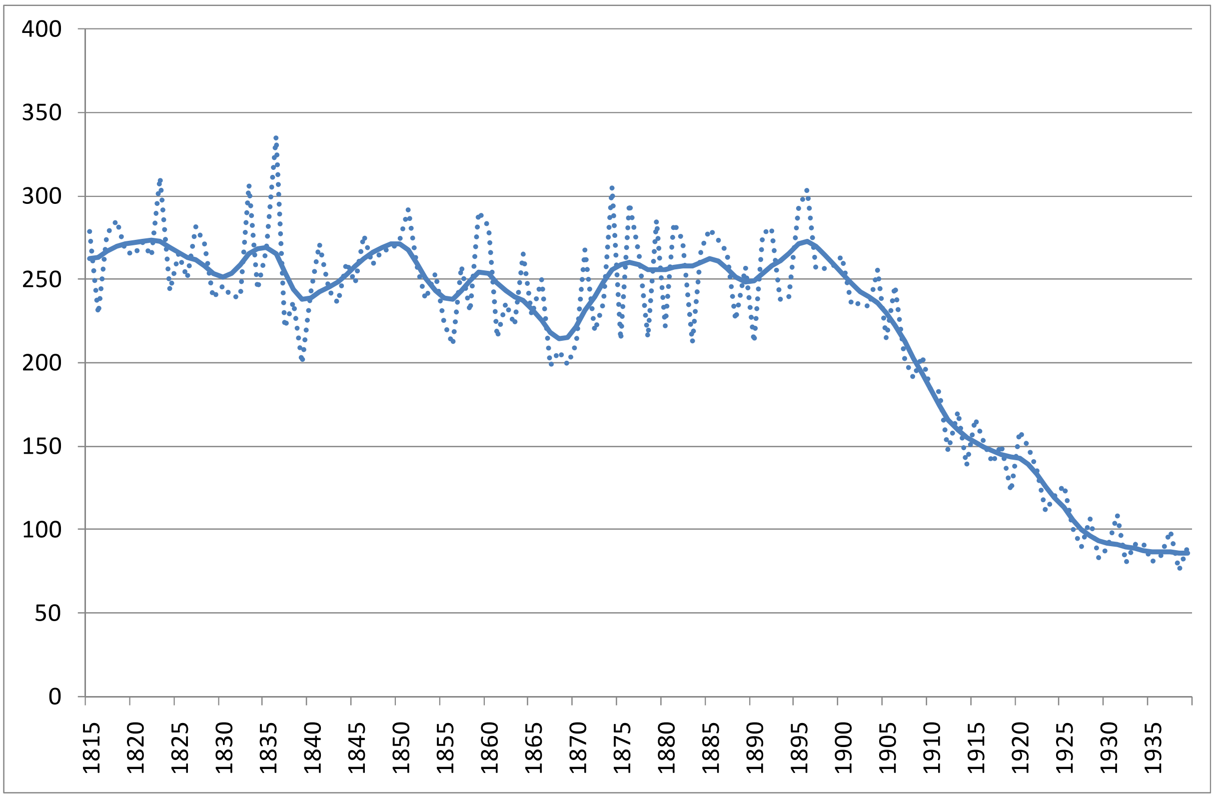

Figure 2. Age-specific marital fertility rates in the Scanian sample, 1815-1939.

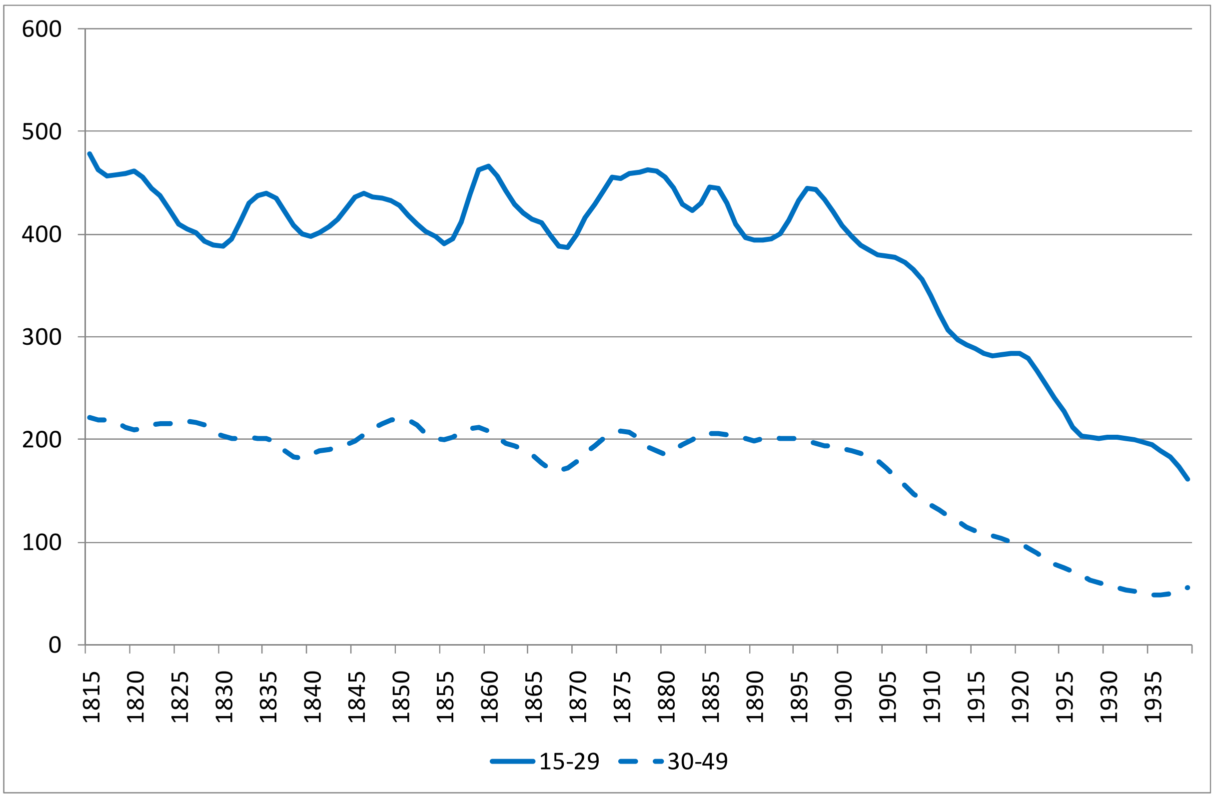

Figure 3. Age-specific marital fertility rates by period in the Scanian sample.

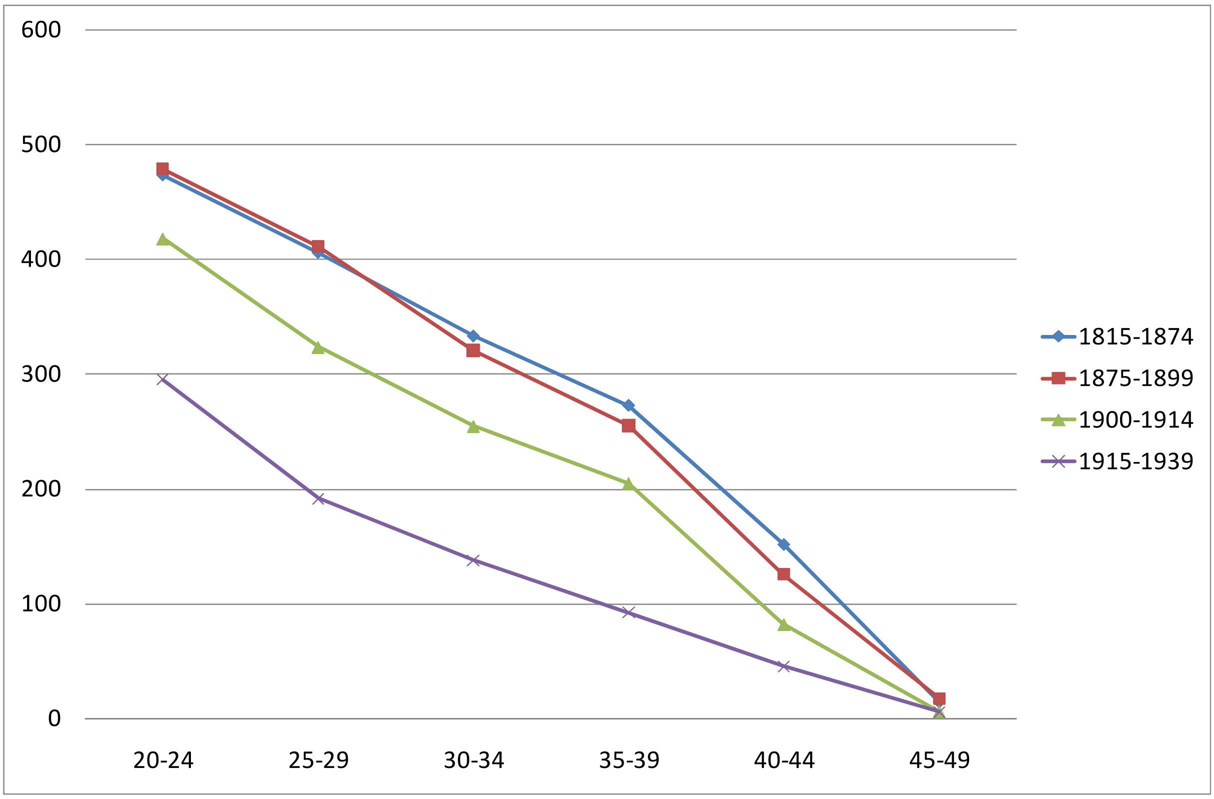

Figure 4. Mean previous birth interval (years) by period in the Scanian sample. First births and higher order births.

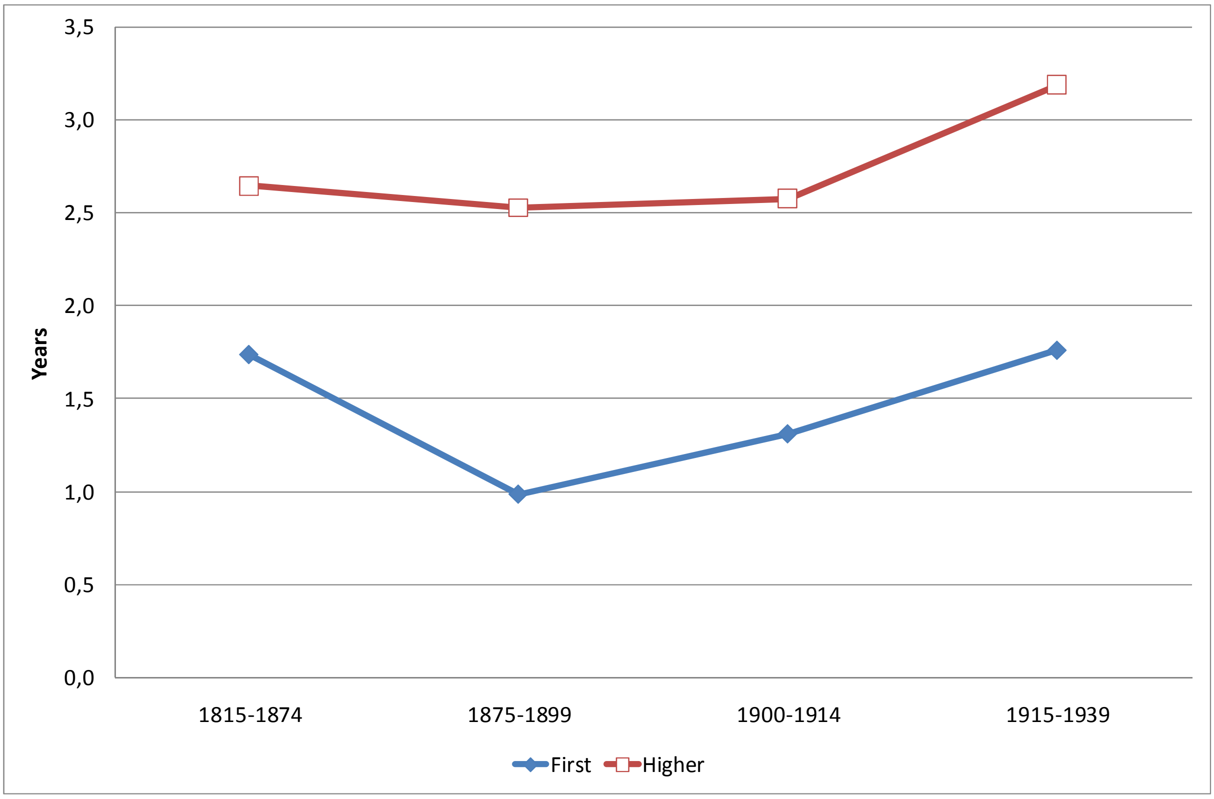

Figure 5. Marital fertility by SES in the Scanian sample 1815-1939.