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## Age homogamy and modernization

### Evidence from turn-of-the-twentieth century Sweden

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## AGE HOMOLOGY AND MODERNIZATION: EVIDENCE FROM TURN-OF-THE-TWENTIETH CENTURY SWEDEN

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*Marriage is a fundamental institution with implications for economic and social development. The age difference between spouses reflects social relations across time and space. It has decreased with modernization, presumably because marriage for sentimental, rather than instrumental, reasons has become widespread. This study investigates age differences between spouses and how they changed at the time of the industrial revolution in Sweden. We analyze spatial differences in age homology by linking them to indicators of industrialization and modernization at the individual and community level. We use full-count census data of about 600,000 couples in 1880-1900. The results show socioeconomic and spatial differences between different measures of age homology, but do not support a link between cultural change and change in age homology. Instead they are more consistent with explanations focusing on how industrialization and urbanization relaxed the old Malthusian marriage pattern, weakening the link between property and wealth, and, by extension, that to marriage and smaller age differences between spouses.*

### Introduction

Marriage is a fundamental institution in most human societies with wide-ranging implications for economic and social development. For example, the historical marriage pattern in Western Europe and its offshoots has been given a prominent role in explaining the distinctive demographic and economic development of early modern Europe (Wrigley and Schofield 1981; Hajnal 1965; Lundh and Kurosu 2014; De Moor and Van Zanden 2010). High ages at first marriage and high proportions of people never marrying were due to the required formation of an independent household upon marriage (Hajnal 1983). This lowered overall fertility through so-called preventive checks and helped keep the population in line with available resources (Malthus 1803; Wrigley and Schofield 1981). There are also other aspects of the marriage institution that can inform us about social relations in the past. It has been argued that the age difference between spouses is an indication of the power relations between them, thus reflecting gender relations in society more generally (Atkinson and Glass 1985; Cain 1993; Presser 1975) and having implications for partnership dynamics and marital well-being (Barbieri and Hertrich 2006; Fisher 2006). A large age difference was a way for men to dominate women in a conjugal unions, while increasing age homogamy was a sign of the increasing importance of affection and sentimental concerns in partner selection and the decreasing importance of instrumental concerns regarding marriage (Van Poppel et al. 2001). Similar arguments have also been made for other contexts, such as developing countries, linking more equal power structures to age homogamy. In more patriarchal societies age differences are relatively large, while in societies where the woman's position is stronger they are typically smaller and, in particular, the proportion of unions in which the husband is much older than the wife is lower (Casterline et al. 1986).

In his book *The Making of the Modern Family*, Edward Shorter (1975) argued that during the modernization process (starting in the late eighteenth century), which largely coincided with industrialization, urbanization and declining mortality, partner selection in marriage became increasingly determined by sentimental reasons with greater emphasis on romantic love and emotional satisfaction, having previously been

governed largely by instrumental concerns. Happiness, conversation, mutual interests, and sexual intimacy became the ultimate goals of marriage and family life instead of, as before, the linkage of lineages, amalgamation of property or other materialistic factors. A similar view of a fundamental change in the marriage institution around this time in history was presented by Ernest Burgess and Harvey Locke in their book *The Family: From Institution to Companionship* (1945). The “compassionate marriage” was based on bonds of sentiment and love, where partners were friends and companions. At the same time, the family was based on a strict division of labor along the lines of separate spheres, with men working outside the home and women being relegated to domestic work. This was nonetheless a major transformation compared to the past when marriage and family life were mainly an arena for procreation and linking family lineages and property. Indeed, it can be viewed as the first step towards the individualization of marriage that took its final form in the period after the 1960s (Cherlin 2004).

This increasing importance of sentiment, love, and friendship in marriage was associated with, and indeed required, age homogamy (Shorter 1975). While a large spousal age difference signifies unequal power relations within the household and a predominance of instrumental considerations in selecting a spouse, similarity in age is associated with similar preferences and values, mutual interests and goals in life, and better communication, all required for love-based marriages. The long-term trends towards increasing age homogamy (e.g. Presser 1975; Atkinson and Glass 1985; Berardo et al. 1993; Vera et al. 1985) constitute empirical support for this hypothesis, linking modernization to age homogamy through less instrumental partner selection (see Van Poppel et al. 2001; Van de Putte et al. 2009).

In this study we will put this theory to a different test. Instead of looking at long-term trends in age homogamy we will analyze spatial differences at the time of the industrial revolution in Sweden, because what goes on at national level may not apply equally across the country given regional variation in cultural norms and socioeconomic conditions. Geographical differences in age homogamy are linked to indicators of industrialization and modernization at individual and community level.

## Age Homogamy and Modernization

We use full-count census data of about 600,000 couples in the period 1880-1900 for the empirical analysis. Our results show both socioeconomic and spatial differences in different measures of age homogamy, but they do not offer strong support for a link between cultural change and change in age homogamy. Instead the results seem mostly consistent with explanations focusing on how industrialization and urbanization relaxed the old Malthusian marriage pattern, weakening the link between property and wealth on the one hand and marriage on the other. This change in the marriage pattern also involved a trend towards age homogamy and smaller age differences between spouses.

### **Background**

In linking modernization to age homogamy, most researchers have looked at trends over time and interpreted one towards more same-age marriages and fewer marriages with large age differences as basically confirming the hypothesis that modernization meant fewer instrumental considerations in partner selection and paved the way for love-based marriages built on affection, emotions, shared values and conversation (Shorter 1975; Van Poppel et al. 2001).

In some research the hypothesis has been put to more rigorous testing, using micro-level data and studying socioeconomic and geographic differentials. Van de Putte et al. (2009), for example, study the role of class and urbanicity in age differences in nineteenth-century Belgium. They argue that there should be larger age differences between elite groups and farmers because these marriages were to a greater extent economic alliances built on property or other forms of wealth, which was associated with more patriarchal relations in the household. These concerns were much less important among the working classes, which is why these groups were more likely to change their behavior and adopt a marriage pattern with smaller age differences. Other researchers have assigned the middle classes the role of agents of change, predicting them to be early adopters of a new marriage pattern based on romantic love (e.g. Frykman and Löfgren 1987). Higher social groups could be expected to be more likely to formulate and adopt new ideas because they were more likely to do so, and they increasingly felt it important to distinguish themselves

from the lower classes (Frykman and Löfgren 1987; Van de Putte 2007). In his theory of innovation-diffusion more generally, Rogers (1962) identified the following five groups in the diffusion process with strong links to socioeconomic status (SES): innovators (highest SES); early adopters (high SES); early majority (average SES); late majority (below average SES); and laggards (lowest SES). Support for these ideas can be found in the decline in fertility in the late nineteenth century, when the elite and upper middle classes acted as forerunners while farmers and unskilled laborers in particular were laggards (Dribe and Scalone 2014; Molitoris and Dribe 2016). Based on these theories, the middle class, and possibly also the elite, should have been the forerunners and early adopters of new attitudes on marriage that focused on romantic love and smaller age differences between partners.

City life has often been connected to anonymity and lower levels of social control, and city dwellers usually depend more on wage labor and less on property for their livelihood. Both of these factors promoted a marriage pattern where partner selection was based less on instrumental concerns and more on equality between spouses and on feelings, which in turn should be related to smaller age differences between spouses (Van de Putte et al. 2009). In addition, industrialization in general should have similar effects by weakening the connection between property and marriage and increasing living standards, which would serve to ease the Malthusian (preventive) check. However, as pointed out by Van de Putte et al., industrialization and the improved standard of living associated with it do not provide the full explanation, as these often predate change in the marriage pattern. Industrialization may have been a necessary condition for new marriage patterns to emerge by relaxing the constraints on marriage, but it was not sufficient in itself. A process of cultural change accompanied industrialization in the modernization process, and this cultural change saw the emergence of sentiment and romantic love as the basis for marriage; in other words, the rise of the compassionate marriage. According to the authors, increasing age homogamy was a crucial part of this process.

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In another study, Van Poppel et al. (2001) look at age homogamy in the Netherlands from the mid-nineteenth century until present times. Age homogamy gradually increased from about 1850 until 1970, and this trend not only is a result of a lower age at marriage but also can be connected to broader societal changes affecting both individual preferences for age homogamy and the degree of influence of parents and other third parties over when and whom to marry (see also Kalmijn 1998).

During the period of our study (1880-1900) the average age at first marriage in Sweden was fairly stable: about 29 years for men and 27 for women. Over the entire period 1861/70-1900/10, the marriage age declined by 0.2 years for men and 0.7 years for women, while in the subsequent 50-year period 1901/10-1951/60, it declined by 0.8 years for men and by 1.4 years for women (Statistics Sweden 1969, table 32). Christer Lundh (2013), however, found considerable regional differences in marriage patterns in late nineteenth-century Sweden. According to Lundh, the western parts of the country (including the southernmost counties) presented a different pattern from the rest of the country, with higher ages at marriage for both men and women and also fewer changes over time, which can be linked to both socioeconomic structure and culture.

Summarizing the discussion thus far, we expect age homogamy to increase over time during the period of this study and man-older heterogamy to decline in importance. Moreover, we expect socioeconomic status, the degree of urbanicity and exposure to the selfsame measured in terms of migration experience and distance from urban areas to be important predictors of age homogamy. In addition, the character of the local community (i.e. the parish) should affect the local marriage culture, which in itself should have an independent impact on age homogamy when taking individual-level characteristics into account. More specifically, we expect the elite to be the least homogamous, while the middle class should make an early transition to age homogamy if a cultural explanation is important. From an economic point of view, we would instead expect the working class to be the most homogamous because there were no reasons for large age differences in their case, and also they would be the most exposed to potential partners of their own age. We expect industrialization to be associated with age homogamy from both an economic and a cultural



point of view, as it should be linked both to an expansion of wage labor, and thus a weaker connection between access to property and marriage, and to modernization in terms of values and attitudes (less conservative and traditional and more individual and modern). Urban residence is expected to be associated with greater age homogamy because the social control of third parties is expected to be weaker, and also because of more wage labor and easier access to independent housing, which should promote earlier household formation. It is also likely that innovative behavior in the form of new attitudes towards marriage and partner selection are seen earlier in the cities than in the countryside, and here we would also expect areas in close contact with the Continent to have been early adopters (i.e. the port towns of Malmö and Gothenburg). For the same reasons a longer distance from the major cities can be expected to be related to less homogamy and greater age differences. Education should promote homogamy if this is related to cultural innovation, which would lead us to expect a relationship between the educational orientation of the local community and the extent of migration to be positively associated with homogamy and negatively related to age differences between spouses.

In the following, we test these hypotheses empirically using census data from which we construct measures of individual socioeconomic status, migration experience and distance from place of residence to the three major cities of Stockholm, Gothenburg, and Malmö, as well as community-level indicators of industrialization, educational orientation, and presence of migrants.

### **Data**

We use micro-level data from three Swedish full-count censuses (1880, 1890 and 1900). In total, the data include approximately 14.6 million individuals in 3.9 million households; the 1880 census includes circa 4.6 million individuals in 1.2 million households, while the corresponding figures for the 1890 and 1900 censuses are 4.8/1.3 and 5.2/1.4 million respectively. These data were digitized by the Swedish National Archives and published by the North Atlantic Population Project (NAPP, [www.nappdata.org](http://www.nappdata.org)), which adopts the same format as the

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Integrated Public Use Microdata Series (IPUMS) (Ruggles et al. 2011). All registered individuals are grouped by household. In this way, each individual record reports the household index number and the person index within that household. Available attributes of individuals include age, sex, marital status, parish of birth and parish of residence. The individual's relationship to the household head is also recorded. In addition, there are family pointer variables indicating the personal number within the household, as given by the person index, of the mother, father, or spouse, making it possible to link each woman to her husband and children. There is no information on either age at marriage or times marrying, which is unfortunate in a study of age homogamy as both factors are known to be related to this (Atkinson and Glass 1985; Berardo et al. 1993; Van Poppel et al. 2001). We seek to remedy this shortcoming by looking at couples where the women are quite young (within the maximum of ten years older than the average age at first marriage), which makes it more likely that we are picking up recent and first marriages. Hence, in this analysis we study currently married couples where both spouses are present in the same household and where the woman is younger than 35 years. In total, we observe about 660,000 couples in the three censuses. We perform a sensitivity analysis to see if our results hold up for different sample restrictions by extending our sample to include all couples with women below 55 (about 1.8 million couples in the three censuses). We also further restrict our sample to include all couples with women under 35 and with children younger than four in the household.

The dataset offers detailed information on the man's occupation, allowing classification into a fairly large number of occupational groups using the Historical International Standard Classification of Occupations (HISCO, Van Leeuwen, Maas and Miles 2002). Based on this coding scheme we differentiate between twelve different social classes using the international classification scheme HISCLASS that accounts for skill level, degree of supervision, type of work (manual vs. non-manual), and whether residence was in an urban or rural area (Van Leeuwen and Maas 2011). It contains the following classes: 1) Higher managers; 2) Higher professionals; 3) Lower managers; 4) Lower professionals, clerical and sales personnel; 5) Lower clerical and sales personnel; 6) Foremen;

7) Medium skilled workers; 8) Farmers and fishermen; 9) Lower skilled workers; 10) Lower skilled farm workers; 11) Unskilled workers; and 12) Unskilled farm workers. To avoid problems of small numbers of observations we merge HISCLASS 1 and 2 into a group of Higher managers and professionals, HISCLASS 3, 4 and 5 into a group of Lower managers and professionals, and HISCLASS 6 and 7 into a group of Skilled workers.

The census data is structured by parish of residence, which allows us to construct a number of parish-level indicators measuring industrialization, migration and educational orientation. There is a total of 2,435 time-constant parishes for which we derive information on contextual conditions based on aggregated census data. The importance of industrialization is measured by the proportion of working-age men employed in industry in the parish of residence. The measure is based on the HISCO coded occupations (codes 71105 through 98990) and calculated for the male population aged 15-64. It should reflect the level of industrialization in the community. In addition, we also include a similar variable measuring the proportion of the labor force employed in agriculture, as we believe agriculture to have been a laggard in changing marriage patterns. Educational orientation is measured by the number of teachers employed in the compulsory school system per 100 children of school age (7-14 years). More teachers per 100 students indicate a stronger commitment to education in the community. This variable was previously found to be negatively associated with marital fertility in a county-level analysis (Dribe 2009). In addition, the effect of socioeconomic status will serve as an indirect proxy of family-level educational investment as we expect upper and middle classes to have been more likely to ensure their children received an education. We include the proportion of the total population born in a different county. The community-level indicators were classified as high (top 25 percent), medium (medium 50 percent) or low (bottom 25 percent). Finally, we include a variable based on the parish centroids to measure the distance from any of the three major cities of Stockholm, Gothenburg and Malmö, as categorized in 12 different groups.

## **Methods**

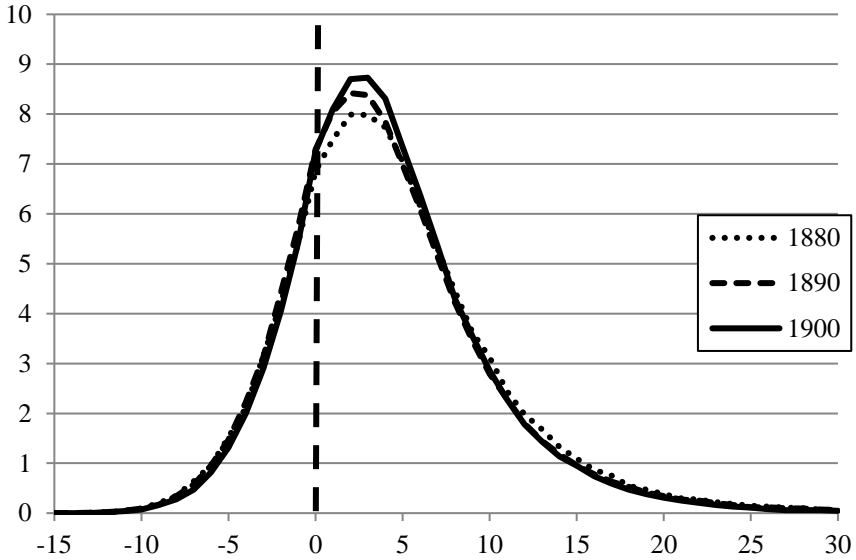
## Age Homogamy and Modernization

There is no generally accepted definition of age homogamy in the literature (Berardo et al. 1993; Van Poppel et al. 2001). The definition adopted affects the results a great deal, as a narrow definition will characterize many marriages as heterogamous despite being within a common, and within the population a universally accepted, age range. On the other hand, a broad definition risks missing important trends and differentials in age heterogamy. Because the censuses do not include information on age at marriage or times married, we begin by calculating the age difference between husbands and wives in the sample of couples displayed by census year in Figure 1. Table 1 provides the means and standard deviations of these age differences as well as the absolute values of these. The latter measure is more appropriate when studying age homogamy, because symmetrical changes in the age gaps between man-older and woman-older couples will not be visible in the former measure but will be captured as a decline in age difference by the latter.

**Table 1**  
Mean age difference by census year

Year	Husband-wife		Absolute values		N
	Mean	Std. Dev.	Mean	Std. Dev.	
1880	4.43	6.15	5.55	5.16	212,823
1890	4.16	5.98	5.28	5.03	221,937
1900	4.21	5.74	5.21	4.85	225,136
Total	4.26	5.96	5.34	5.01	659,896

*Source:* SweCens, The National Archives. See also the North Atlantic Population Project ([www.nappdata.org](http://www.nappdata.org)).



Source: See Table 1.

**Figure 1**

Distribution of age differences (husband-wife) by census year (percent)

Table 1 shows that age differences declined somewhat over the 20-year period studied. Throughout the period, husbands were on average about four years older than their wives, but the full distributions in Figure 1 show that there was considerable variation, with a sizeable proportion of heterogamous couples where the woman was older than the husband. Nonetheless, it is clear from the figure that a two or three-year age difference in favor of the husband was most common (about 8-9 percent each in all three census years). In comparison, the average age difference between all couples with women aged below 55 was 3.2 years (not shown); the smaller difference being explained by a higher proportion of woman-older couples in this sample (because there were most likely more remarriages in this broader group).

Table 2 displays age differences showing that in about 18 percent of cases the wife was older than the husband. In almost 60 percent of cases

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the husband was at least three years older than the wife, and in about 30 percent the husband was six years older or more. Both the proportion of wife-older couples and that of couples where the husband was more than six years older than the wife declined over time, with a corresponding increase in the proportion of couples where the husband was 0-3 years older than the wife. Table 3 shows the proportion of homogamous marriages according to three different definitions: +/- 1 year, +/- 2 years and +3/-1 years (husband's age-wife's age). There is a trend toward increasing age homogamy, regardless of measure. Because two-year and three-year age differences were the most common we include them both in our homogamy measure, and will henceforth use the third, and most inclusive, definition of homogamy (+3/-1). In the analysis we look at the absolute age differences, homogamy and heterogamy where the man is six or more years older than the wife ( $H > 6$ -heterogamy). The main focus, however, is on the latter two measures of homogamy and heterogamy.

**Table 2**  
Homogamy and heterogamy by census year (%)

	1880	1890	1900	All
Wife older	18.7	19.2	17.5	18.5
Husband 0-3 years older	22.3	23.8	24.1	23.4
Husband 3-6 years older	28.9	29.3	30.8	29.7
Husband >6 years older	30.0	27.7	27.6	28.4
Total	100	100	100	100
N	212,823	221,937	225,136	659,896

*Source:* See Table 1.

**Table 3**  
 Proportion homogamous couples by different definitions (%)

	Husband-wife age difference			N
	-1 - +1	-2 - +2	-1 - +3	
1880	19.8	32.0	35.7	212,823
1890	21.1	33.9	37.9	221,937
1900	20.8	33.5	38.2	225,136
All	20.6	33.2	37.3	659,896

*Source:* See Table 1.

Using these measures, we first provide a descriptive analysis of regional differences and changes over time, and then present results from a regression analysis where we relate the age difference to community-level modernization indicators as well as to individual-level measures of socioeconomic status, migration history and place of residence. In addition, we add county-level fixed effects to capture unobserved heterogeneity at the county level, including broader regional differences in age at marriage, level of secularization and other factors that we cannot measure and control for directly. This means that the impact of our individual and community variables will be identified only on the within-county variation, and is thus not affected by differences between individuals and communities across counties. We also present regression estimates for the three census years separately to identify possible changes over time in the determinants of homogamy and heterogamy. All regressions were estimated using OLS for ease of interpretation, and because there is no obvious reason to suspect any other than the normal distribution for the variables of interest. All regressions were estimated with heteroscedasticity robust standard errors. The dependent variables are absolute age differences (continuous), homogamy (+3/-1 years), and  $H > 6$  heterogamy. The latter two analyses were estimated as linear probability models, with the outcome under consideration defined as 1 and all other outcomes as 0.

### Results

We begin by looking at the homogamy pattern across counties in the three census years. Table A1 (in the appendix) displays the means of the three different age difference indicators described above. Counties in the region labelled by Lundh (2013) as western Sweden (Jönköping, Kronoberg, Kalmar, Blekinge, Kristianstad, Malmöhus, Halland, Göteborg and Bohus, Älvsborg, Skaraborg and Värmland) usually have higher than average absolute age differences, a higher proportion of  $H > 6$  heterogamy, and correspondingly lower levels of homogamy. This is persistently the case across the years for Jönköping, Kronoberg, Kalmar, Halland and Älvsborg, and often, but not always, the case for the other western counties. Counties in eastern Sweden often have lower than average age differences and lower proportions of  $H > 6$  heterogamy, and instead have higher than average proportions of homogamous couples. This is particularly true for Uppsala, Södermanland, Örebro, Västmanland, Kopparberg, and Gävleborg, but is not the case for Gotland and Jämtland, which both resemble more closely the western counties.

Hence, the counties identified by Lundh (2013) as showing relatively high ages at marriage also show greater age differences and less homogamy, which makes sense from a demographic point of view. This also highlights the importance of including regional fixed effects, and confining the sample to younger couples (where the women are younger than 35) to avoid confounding impacts from different patterns of age at marriage and remarriage. Given that the data do not include indicators of age at marriage or times married, we believe this strategy is the best approach available.

In order to look in more detail at the connection between modernization and age homogamy, we turn to the regression analysis. First we study absolute age differences (Table 4) that seem to decline over time even when controlling for all variables in the full model. The age differences declined by approximately 0.24 years over the 20 years of observation. In a model controlling only for age the corresponding



figure is 0.36 years (not shown). The elite group (higher managers and professionals) shows the largest age differences, while the lower-skilled workers show the smallest, with farmers taking an intermediate position. The socioeconomic differentials are fairly stable over time and, if anything, seem to decline. The results indicate that socioeconomic differentials in spousal age differences did not emerge during the period of study, and neither did they emerge as the result of a group acting as forerunner but were already present in 1880, then narrowing somewhat over the following decades. As regards individual migration experience, couples where the husband had migrated show the largest age differences, while couples where both husband and wife are stayers in their parish of birth show the smallest age differences. This pattern is stable across the census years. Living in one of the three major urban areas is associated with smaller age differences between spouses, and longer distances from one of these three cities is associated with greater age differences. The cities of Gothenburg and Malmö show smaller age differences in 1880 than does Stockholm, while these are not as clear in 1890 and 1900. However, the basic pattern of a positive association between distance from one of the three major cities and age difference between spouses persists throughout the period.

Turning to the community-level indicators of modernization, more industrial employment is associated with smaller age differences. There is some change over time in that this pattern appears to emerge and become fully evident in 1900. The results of educational orientation are not as clear. The pooled sample shows that medium levels of educational orientation are more closely associated with smaller age differences than are either low or high levels. In a model without county-fixed effects, the association with high levels of educational orientation is negative and of a similar magnitude to that of medium levels. Apparently, county-fixed effects capture some, but not all, of the differences related to commitment to education and educational spending. There are also differences across the different censuses, the clearest pattern being seen in 1880, which is not what we would expect from a modernization point of view.

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**Table 4**  
Regression estimates of the absolute age difference

	All years		1880		1890		1900	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
<b>Year</b>								
1880	ref.		—	—	—	—	—	—
1890	-0.177	0.00	—	—	—	—	—	—
1900	-0.235	0.00	—	—	—	—	—	—
<b>Age</b>								
Age	-1.459	0.00	-1.478	0.00	-1.722	0.00	-1.207	0.00
Age <sup>2</sup>	0.024	0.00	0.024	0.00	0.029	0.00	0.020	0.00
<b>HISCLASS</b>								
Higher managers and professionals	ref.		ref.		ref.		ref.	
Lower managers and professionals	-1.541	0.00	-1.404	0.00	-1.701	0.00	-1.505	0.00
Skilled workers	-2.722	0.00	-2.700	0.00	-2.838	0.00	-2.595	0.00
Farmers and fishermen	-1.511	0.00	-1.538	0.00	-1.722	0.00	-1.238	0.00
Lower skilled workers	-3.500	0.00	-3.657	0.00	-3.691	0.00	-3.203	0.00
Unskilled workers	-3.049	0.00	-2.893	0.00	-3.186	0.00	-3.023	0.00
Farm workers	-2.994	0.00	-2.969	0.00	-3.216	0.00	-2.778	0.00
NA	-2.699	0.00	-2.708	0.00	-2.830	0.00	-2.509	0.00
<b>Migration</b>								
Both migrants	ref.		ref.		ref.		ref.	
Only wife migrant	-0.223	0.00	-0.254	0.00	-0.207	0.00	-0.223	0.00
Only husband migrant	0.514	0.00	0.446	0.00	0.573	0.00	0.507	0.00
Both non-migrants	-0.506	0.00	-0.499	0.00	-0.506	0.00	-0.526	0.00
<b>Distance from city</b>								
0-10 km from Stockholm	ref.		ref.		ref.		ref.	
10-50 km from Stockholm	0.272	0.00	0.142	0.16	0.553	0.00	0.084	0.27
50-100 km from Stockholm	0.407	0.00	0.370	0.01	0.587	0.00	0.211	0.08
100-150 km from Stockholm	0.453	0.00	0.301	0.06	0.730	0.00	0.288	0.03
150-200 km from Stockholm	0.583	0.00	0.319	0.07	0.943	0.00	0.383	0.01
0-10 km from Malmö	0.016	0.91	-0.193	0.43	0.432	0.07	-0.272	0.24
10-50 km from Malmö	0.275	0.04	0.152	0.53	0.441	0.06	0.072	0.75
50-100 km from Malmö	0.294	0.02	0.116	0.60	0.499	0.02	0.139	0.51
0-10 km from Gothenburg	-0.084	0.45	-0.492	0.02	0.171	0.37	0.009	0.96
10-50 km from Gothenburg	0.531	0.00	0.264	0.20	0.790	0.00	0.371	0.04
50-100 km from Gothenburg	0.428	0.00	0.172	0.37	0.638	0.00	0.345	0.04
Other areas	0.493	0.00	0.151	0.40	0.776	0.00	0.445	0.00
<b>Industrial employment</b>								
Low	ref.		ref.		ref.		ref.	
Medium	-0.088	0.00	-0.057	0.11	-0.078	0.02	-0.147	0.00
High	-0.055	0.03	0.030	0.52	-0.064	0.14	-0.171	0.00

**Table 4, continued**

	All years		1880		1890		1900	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
<b>Education</b>								
Low		ref.		ref.		ref.		ref.
Medium	-0.024	0.14	-0.049	0.10	0.043	0.13	-0.020	0.47
High	0.003	0.89	-0.067	0.07	0.146	0.00	0.107	0.00
<b>Agricultural employment</b>								
Low		ref.		ref.		ref.		ref.
Medium	0.029	0.09	0.046	0.14	-0.018	0.54	0.060	0.05
High	0.054	0.03	0.044	0.35	-0.019	0.65	0.058	0.16
<b>Migration</b>								
Low		ref.		ref.		ref.		ref.
Medium	0.066	0.00	0.058	0.08	0.054	0.12	0.070	0.05
High	-0.019	0.43	-0.014	0.74	-0.028	0.50	-0.038	0.37
<b>County</b>								
Stockholm		ref.		ref.		ref.		ref.
Uppsala	-0.321	0.00	-0.493	0.00	-0.214	0.09	-0.295	0.02
Södermanland	-0.592	0.00	-0.801	0.00	-0.543	0.00	-0.437	0.00
Östergötland	-0.290	0.00	-0.194	0.23	-0.359	0.01	-0.286	0.04
Jönköping	-0.270	0.00	-0.159	0.36	-0.371	0.02	-0.272	0.08
Kronoberg	-0.369	0.00	-0.260	0.14	-0.447	0.01	-0.378	0.02
Kalmar	-0.076	0.41	-0.018	0.91	-0.154	0.33	-0.040	0.79
Gotland	-0.056	0.59	0.013	0.95	-0.156	0.39	-0.117	0.51
Blekinge	-0.369	0.00	-0.191	0.29	-0.504	0.00	-0.377	0.02
Kristianstad	-0.221	0.06	-0.234	0.26	-0.190	0.35	-0.203	0.32
Malmöhus	-0.272	0.03	-0.403	0.07	-0.147	0.50	-0.207	0.34
Halland	-0.160	0.11	-0.135	0.46	-0.117	0.49	-0.187	0.25
Göteborg and Bohus	0.081	0.43	0.305	0.11	-0.025	0.88	0.011	0.95
Älvsborg	-0.042	0.67	0.011	0.95	-0.032	0.85	-0.048	0.77
Skaraborg	-0.343	0.00	-0.244	0.16	-0.460	0.00	-0.329	0.03
Värmland	-0.190	0.04	-0.208	0.23	-0.228	0.15	-0.116	0.45
Örebro	-0.537	0.00	-0.551	0.00	-0.678	0.00	-0.380	0.01
Västmanland	-0.661	0.00	-0.867	0.00	-0.714	0.00	-0.431	0.00
Kopparberg	-0.942	0.00	-1.192	0.00	-0.975	0.00	-0.651	0.00
Gävleborg	-0.518	0.00	-0.807	0.00	-0.495	0.00	-0.245	0.09
Västernorrland	-0.113	0.22	-0.430	0.01	-0.151	0.34	0.250	0.10
Jämtland	0.483	0.00	0.141	0.44	0.294	0.07	0.976	0.00
Västerbotten	-0.333	0.00	-0.328	0.07	-0.458	0.01	-0.216	0.16
Norrbotten	-0.168	0.08	-0.296	0.10	-0.320	0.05	0.031	0.84
Constant	29.529	0.00	30.361	0.00	32.899	0.00	25.450	0.00
<i>N</i>	659,896		212,823		221,937		225,136	
<i>F</i>	532.7	0.00	188.6	0.00	185.0	0.00	185.7	0.00
<i>R</i> <sup>2</sup>	0.047		0.048		0.048		0.047	

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As expected, more agricultural employment is associated with larger age differences, but it is only statistically significant in the pooled model. The proportion of migrants in the parish does not show a consistent association with age difference between husbands and wives. Medium levels of migrants are associated with larger age differences, while high levels are associated with smaller or no age differences (the coefficients are not statistically significant for high levels).

Next, we look at the results regarding  $H>6$  heterogamy (See the appendix, Table A2). There is a decline between 1880 and 1890 in the proportion of cases of man-older heterogamy (1.4 percentage points), but it remains stable between 1890 and 1900. A declining proportion of couples where the man is much older than the wife is clearly consistent with the modernization hypothesis, but the fact that there is no change between 1890 and 1900, which was one of the most dynamic decades in Swedish economic history, does not fit particularly well with this idea.

$H>6$  heterogamy was most common in the elite group of higher managers and professionals and least common among the lower-skilled workers, which is similar to what we saw earlier for absolute age differences between spouses. The pattern is also similar over time, but the differentials narrow somewhat as is also the case for the age differences. Couples where the husband had migrated are more likely to be  $H>6$  heterogamous, and this holds throughout the census years. As expected, living in a community farther away from the major cities is associated with more  $H>6$  heterogamy.

$H>6$  heterogamy is less common among couples living in more industrialized communities, and this association becomes stronger over time. There is a weak negative association between the educational orientation of the community and the probability of  $H>6$  heterogamy, but it is only statistically significant for medium levels.<sup>1</sup> This pattern is, however, not consistent across census years. For migration history there are only weak associations with the probability of man-older heterogamy.

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<sup>1</sup> In a model without county fixed effects, the high level is also statistically significant and of a similar magnitude to the medium level.

Only one coefficient is statistically significant, and it is positive, which is not consistent with the modernization hypothesis.

Finally, we turn to the analysis of homogamy (where the husband-wife age difference is -1 to +3 years). The results are displayed in Table A3 (appendix) and point to an increasing trend in homogamy over time. The probability of age homogamy is 1.9 percentage points higher in 1900 than in 1880 in the full model (2.6 percentage points in a model controlling only for age). Thus, even though these coefficients are not that high, we are looking at a rather short period of time and the results are clearly consistent with expectations.

The elite group is the least homogamous and the lower-skilled workers are the most homogamous with farmers taking an intermediate position, which is in line with previous results. These patterns do not change much over time, but as was the case with both age difference and man-older heterogamy, differences across socioeconomic status groups narrow somewhat over time. Stayers are most homogamous in all census years, and couples with a migrant husband are the least homogamous. Residing in urban areas is associated with a higher probability of homogamy, and in 1900 this is especially true for Malmö.

Couples in more industrial communities have a somewhat higher probability of homogamy, while those living in agricultural communities have a lower probability, which is consistent with the hypothesis of shifting underlying logics of partner choice with industrialization. Medium level educational orientation is associated with somewhat higher probabilities of homogamy, but this association is not strong, and also varies a bit over time. In a model without county fixed effects the associations are stronger and statistically significant for both medium and high levels. Couples in communities with more migrants are less likely to be homogamous, but the associations are quite weak.

These analyses were all based on couples where the wives were below 35 years of age, in order to focus the analysis on first marriages and relatively recent ones. We perform a sensitivity analysis by also looking at couples with women below 55 years, which considerably

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changes the descriptive analysis of age difference and proportion of homogamous marriages (more women-older marriages and smaller overall age differences), but does not change the conclusions from the analysis of the determinants to any large extent (detailed results not shown but available on request). Overall, both trends and estimates of the various determinants are weaker in the larger sample of couples with women below age 55. In addition, we limited the sample to only include couples with women below age 35 and with children below age four in the household, to be even more certain that we are looking at recent unions. These results were all highly similar to the ones for those couples with women below age 35. Taken together, we are confident that our results are not simply byproducts of different ages at marriage or remarriage but are real in the sense that they are connected to age homogamy net of these factors.

### Conclusion

We studied spatial and temporal aspects of age homogamy in Sweden at the time of the industrial revolution with the aim of assessing the credibility of popular hypotheses linking the development of age homogamy to modernization. To summarize our findings, there appears to be a trend over time towards smaller age differences, less man-older heterogamy ( $H > 6$ ), and more homogamy. Even though the differences across census years are not that large, they are nonetheless consistent with expectations. The elite groups show the largest age difference and are less likely to be homogamous, while the lower skilled workers (construction workers, miners, etc.) show the highest homogamy probability and the smallest age difference. There is no indication that the middle classes were special in terms of age homogamy or that they served as forerunners given that their behavior changed before that of other social groups in the period 1880-1900. That homogamy was less frequent in the elite groups is expected because they relied more than others on property and wealth for their standard of living, which also made marriage alliances based on material resources crucial. This should have slowed down their adoption of a more age homogamous pattern.

Farmers took an intermediate position, which is also what we would expect. Two things stand out as being not immediately consistent with the modernization hypothesis. First, the middle classes do not seem to have played the role of forerunners in the transition to age homogamy, as has been hypothesized by some authors. Second, and more important, there is no indication that socioeconomic differentials emerged over time; if anything they became weaker. It is likely that the working classes always were more homogamous simply because marriage played less of a strategic economic role for them, rather than because they were faster to respond to new ideas and attitudes related to the modernization process.

The age differences in couples where the husband was a migrant were larger, and these marriages were less likely to be homogamous. Instead, couples where both spouses were stayers were actually the most homogamous. This is not consistent with the idea of age homogamy being part of a diffusion of new innovative behavior, because we would expect migrants to be early adopters of such new behavior due to their greater exposure to new ideas. The age differences in couples in or close to urban areas were smaller overall, and were more homogamous and less man-older heterogamous, which is consistent with expectations. Living in more industrialized communities is associated with smaller age differences, more homogamy and less man-older heterogamy in all the census years, which is in line with our expectations. Couples in communities with a greater educational orientation, which we would also expect to be associated with early adoption of new behaviors, were not consistently more homogamous or less man-older heterogamous, and did not show smaller age differences overall. The patterns were more consistent with theory when we did not control for unobserved factors at county level than when we constrained identification to within-county variation. Similarly, the proportion of migrants in the community did not show a consistent impact on homogamy, heterogamy or age difference, in line with expectations from modernization theory.

Even though some of the results clearly are in line with the idea that modernization changed age differences between spouses which resulted in more homogamy and less man-older heterogamy, other aspects are not

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consistent with the standard narrative of modernization and family change. Moreover, both change over time and spatial differences in these patterns seem modest at best, and this during a period when Sweden was experiencing rapid industrialization and rapid change in society, while at the same time there were big differences across the country in levels of industrialization and cultural orientation. In comparison, this period also featured large spatial differences in marital fertility, although these seem not to have been explained primarily by community-level factors (Dribe, Juarez and Scalone 2015). Taken together, this casts some doubt on the hypothesis that increasing age homogamy was a result of a genuine cultural innovation in which romantic love, friendship and affection became the basis of marriage. Although we cannot prove it wrong, the emerging empirical pattern based on data from Swedish censuses seems equally consistent with marriage becoming less connected to property and wealth as a result of industrialization, urbanization and increasing reliance on wage labor. These changes to a large extent relaxed and even eliminated the old Malthusian marriage constraints. The emergence of deliberate fertility control within marriage, which occurred at the same time (e.g. Dribe 2009; Dribe and Scalone 2014), also implied that easier access to marriage did not result in a rapidly increasing population. Instead, Sweden embarked on a road to modern economic growth, where economic growth went together with slowing population growth, leading to sustained increases in output per capita and higher living standards for ordinary people, but it also had far-reaching impacts on individuals and families; that is, on the social relations between individuals within families, not just on their economic activities.



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# APPENDIX

**Table A1**  
Age difference by county and census year

County	Absolute age difference			Husbands > 6 years older			Homogamy (+3/-1)		
	1880	1890	1900	1880	1890	1900	1880	1890	1900
Stockholm	5.85	5.17	5.09	0.320	0.266	0.262	0.339	0.386	0.391
Uppsala	5.45	5.25	4.98	0.299	0.278	0.258	0.352	0.378	0.398
Södermanland	5.12	4.86	4.76	0.267	0.242	0.238	0.381	0.404	0.409
Östergötland	5.59	5.17	5.00	0.300	0.263	0.259	0.357	0.393	0.400
Jönköping	5.85	5.41	5.35	0.325	0.290	0.294	0.341	0.372	0.367
Kronoberg	5.82	5.41	5.41	0.316	0.286	0.289	0.336	0.368	0.374
Kalmar	5.86	5.52	5.45	0.322	0.289	0.295	0.341	0.370	0.372
Gotland	5.99	5.71	5.55	0.342	0.300	0.298	0.318	0.334	0.357
Blekinge	5.74	5.19	5.12	0.300	0.258	0.257	0.354	0.388	0.405
Kristianstad	5.74	5.42	5.25	0.321	0.292	0.272	0.340	0.372	0.384
Malmöhus	5.32	5.12	4.75	0.288	0.268	0.237	0.366	0.392	0.410
Halland	5.91	5.66	5.43	0.333	0.316	0.302	0.330	0.352	0.361
Göteborg and Bohus	5.85	5.24	5.08	0.319	0.268	0.260	0.351	0.389	0.403
Älvsborg	5.96	5.70	5.54	0.327	0.299	0.297	0.337	0.362	0.372
Skaraborg	5.65	5.23	5.28	0.297	0.266	0.274	0.368	0.386	0.375
Värmland	5.53	5.42	5.37	0.295	0.285	0.285	0.364	0.373	0.371
Örebro	5.30	5.03	5.01	0.286	0.254	0.265	0.370	0.395	0.379
Västmanland	4.98	4.84	4.85	0.263	0.252	0.255	0.385	0.401	0.403
Kopparberg	4.53	4.68	4.76	0.217	0.234	0.243	0.423	0.412	0.400
Gävleborg	5.05	5.22	5.16	0.260	0.278	0.273	0.384	0.387	0.387
Västernorrland	5.46	5.58	5.83	0.300	0.311	0.338	0.356	0.352	0.335
Jämtland	6.17	6.23	6.76	0.383	0.384	0.427	0.306	0.311	0.285
Västerbotten	5.59	5.35	5.55	0.302	0.286	0.314	0.352	0.354	0.348
Norrbottn	5.45	5.38	5.63	0.283	0.284	0.316	0.364	0.360	0.353
Sweden	5.55	5.28	5.21	0.300	0.277	0.276	0.357	0.379	0.382

Source: See Table 1.

**Table A2**

Regression estimates of husband &gt;6 years older

	All years		1880		1890		1900	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
<b>Year</b>								
1880	ref		---	---	---	---	---	---
1890	-0.014	0.00	---	---	---	---	---	---
1900	-0.014	0.00	---	---	---	---	---	---
<b>Age</b>								
Age	-0.108	0.00	-0.110	0.00	-0.129	0.00	-0.086	0.00
Age <sup>2</sup>	0.002	0.00	0.002	0.00	0.002	0.00	0.001	0.00
<b>HISCLASS</b>								
Higher managers and professionals	ref		ref		ref		ref	
Lower managers and professionals	-0.113	0.00	-0.098	0.00	-0.129	0.00	-0.109	0.00
Skilled workers	-0.224	0.00	-0.223	0.00	-0.235	0.00	-0.213	0.00
Farmers and fishermen	-0.108	0.00	-0.109	0.00	-0.126	0.00	-0.086	0.00
Lower skilled workers	-0.295	0.00	-0.316	0.00	-0.310	0.00	-0.267	0.00
Unskilled workers	-0.255	0.00	-0.248	0.00	-0.266	0.00	-0.249	0.00
Farm workers	-0.247	0.00	-0.243	0.00	-0.266	0.00	-0.231	0.00
NA	-0.240	0.00	-0.239	0.00	-0.256	0.00	-0.222	0.00
<b>Migration</b>								
Both migrants	ref		ref		ref		ref	
Only wife migrant	-0.031	0.00	-0.032	0.00	-0.030	0.00	-0.030	0.00
Only husband migrant	0.040	0.00	0.036	0.00	0.044	0.00	0.040	0.00
Both non-migrants	-0.049	0.00	-0.046	0.00	-0.050	0.00	-0.050	0.00
<b>Distance from city</b>								
0-10 km from Stockholm	ref		ref		ref		ref	
10-50 km from Stockholm	0.026	0.00	0.020	0.02	0.042	0.00	0.014	0.05
50-100 km from Stockholm	0.044	0.00	0.049	0.00	0.059	0.00	0.021	0.05
100-150 km from Stockholm	0.050	0.00	0.047	0.00	0.069	0.00	0.031	0.01
150-200 km from Stockholm	0.060	0.00	0.049	0.00	0.089	0.00	0.035	0.01
0-10 km from Malmö	0.014	0.28	0.022	0.32	0.048	0.03	-0.031	0.15
10-50 km from Malmö	0.033	0.01	0.052	0.02	0.034	0.10	0.002	0.92
50-100 km from Malmö	0.038	0.00	0.036	0.07	0.052	0.01	0.015	0.44
0-10 km from Gothenburg	0.011	0.26	-0.013	0.47	0.033	0.05	0.012	0.45
10-50 km from Gothenburg	0.066	0.00	0.050	0.01	0.090	0.00	0.046	0.01

50-100 km from Gothenburg	0.047	0.00	0.033	0.05	0.063	0.00	0.038	0.01
Other areas	0.054	0.00	0.036	0.02	0.078	0.00	0.041	0.00
<b>Industrial employment</b>								
Low	ref		ref		ref		ref	
Medium	-0.009	0.00	-0.005	0.11	-0.009	0.00	-0.013	0.00
High	-0.007	0.00	0.002	0.71	-0.009	0.02	-0.018	0.00
<b>Education</b>								
Low	ref		ref		ref		ref	
Medium	-0.003	0.04	-0.002	0.55	0.002	0.44	-0.004	0.10
High	-0.002	0.36	-0.003	0.29	0.008	0.02	0.007	0.03
<b>Agricultural employment</b>								
Low	ref		ref		ref		ref	
Medium	0.002	0.28	0.003	0.23	-0.002	0.39	0.004	0.19
High	0.003	0.24	0.002	0.62	-0.004	0.24	0.003	0.46
<b>Migration</b>								
Low	ref		ref		ref		ref	
Medium	0.004	0.03	0.002	0.51	0.002	0.56	0.005	0.10
High	-0.003	0.18	-0.001	0.74	-0.005	0.18	-0.005	0.19
<b>County</b>								
Stockholm	ref		ref		ref		ref	
Uppsala	-0.029	0.00	-0.043	0.00	-0.024	0.04	-0.023	0.04
Södermanland	-0.054	0.00	-0.073	0.00	-0.053	0.00	-0.037	0.00
Östergötland	-0.034	0.00	-0.032	0.02	-0.045	0.00	-0.023	0.06
Jönköping	-0.031	0.00	-0.031	0.05	-0.045	0.00	-0.018	0.20
Kronoberg	-0.048	0.00	-0.047	0.00	-0.058	0.00	-0.040	0.01
Kalmar	-0.022	0.01	-0.023	0.13	-0.037	0.01	-0.005	0.70
Gotland	-0.017	0.07	-0.010	0.57	-0.036	0.03	-0.015	0.35
Blekinge	-0.053	0.00	-0.047	0.00	-0.068	0.00	-0.043	0.00
Kristianstad	-0.028	0.01	-0.033	0.08	-0.025	0.19	-0.025	0.17
Malmöhus	-0.025	0.03	-0.052	0.01	-0.010	0.63	-0.010	0.62
Halland	-0.018	0.04	-0.023	0.15	-0.017	0.27	-0.013	0.38
Göteborg and Bohus	-0.010	0.26	0.004	0.82	-0.024	0.12	-0.010	0.53
Älvsborg	-0.023	0.01	-0.019	0.23	-0.032	0.04	-0.016	0.28
Skaraborg	-0.047	0.00	-0.045	0.00	-0.060	0.00	-0.038	0.01
Värmland	-0.027	0.00	-0.033	0.03	-0.034	0.02	-0.015	0.28
Örebro	-0.048	0.00	-0.053	0.00	-0.069	0.00	-0.024	0.08
Västmanland	-0.052	0.00	-0.074	0.00	-0.055	0.00	-0.028	0.02

Kopparberg	-0.082	0.00	-0.110	0.00	-0.086	0.00	-0.049	0.00
Gävleborg	-0.049	0.00	-0.079	0.00	-0.049	0.00	-0.019	0.17
Västernorrland	-0.013	0.12	-0.047	0.00	-0.022	0.13	0.028	0.05
Jämtland	0.054	0.00	0.025	0.12	0.033	0.03	0.101	0.00
Västerbotten	-0.039	0.00	-0.048	0.00	-0.057	0.00	-0.015	0.29
Norrbottn	-0.026	0.00	-0.048	0.00	-0.045	0.00	0.003	0.82
Constant	2.173	0.00	2.251	0.00	2.456	0.00	1.829	0.00
N	659,896		212,823		221,937		225,136	
F	617.3	0.00	236.5	0.00	218.6	0.00	201.6	0.00
R <sup>2</sup>	0.050		0.055		0.051		0.047	

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*Source:* See Table 1.



**Table A3**

Regression estimates of homogamy (+3/-1)

	All years		1880		1890		1900	
	Coef.	P>t	Coef.	P>t	Coef.	P>t	Coef.	P>t
<b>Year</b>								
1880	ref		---	---	---	---	---	---
1890	0.016	0.00	---	---	---	---	---	---
1900	0.019	0.00	---	---	---	---	---	---
<b>Age</b>								
Age	0.128	0.00	0.127	0.00	0.150	0.00	0.108	0.00
Age <sup>2</sup>	-0.002	0.00	-0.002	0.00	-0.003	0.00	-0.002	0.00
<b>HISCLASS</b>								
Higher managers and professionals	ref		ref		ref		ref	
Lower managers and professionals	0.070	0.00	0.065	0.00	0.076	0.00	0.070	0.00
Skilled workers	0.134	0.00	0.127	0.00	0.139	0.00	0.133	0.00
Farmers and fishermen	0.062	0.00	0.064	0.00	0.072	0.00	0.048	0.00
Lower skilled workers	0.174	0.00	0.182	0.00	0.182	0.00	0.162	0.00
Unskilled workers	0.146	0.00	0.136	0.00	0.149	0.00	0.149	0.00
Farm workers	0.138	0.00	0.136	0.00	0.147	0.00	0.129	0.00
NA	0.138	0.00	0.140	0.00	0.138	0.00	0.133	0.00
<b>Migration</b>								
Both migrants	ref		ref		ref		ref	
Only wife migrant	0.011	0.00	0.008	0.09	0.006	0.20	0.018	0.00
Only husband migrant	-0.033	0.00	-0.026	0.00	-0.036	0.00	-0.035	0.00
Both non-migrants	0.034	0.00	0.031	0.00	0.031	0.00	0.038	0.00
<b>Distance from city</b>								
0-10 km from Stockholm	ref		ref		ref		ref	
10-50 km from Stockholm	-0.021	0.00	-0.012	0.17	-0.035	0.00	-0.013	0.10
50-100 km from Stockholm	-0.028	0.00	-0.032	0.01	-0.040	0.00	-0.010	0.37
100-150 km from Stockholm	-0.034	0.00	-0.031	0.03	-0.048	0.00	-0.023	0.09
150-200 km from Stockholm	-0.042	0.00	-0.037	0.02	-0.061	0.00	-0.024	0.12
0-10 km from Malmö	0.006	0.66	0.003	0.90	-0.024	0.32	0.038	0.11
10-50 km from Malmö	-0.017	0.19	-0.017	0.45	-0.037	0.10	0.008	0.75
50-100 km from Malmö	-0.026	0.03	-0.018	0.38	-0.048	0.02	-0.006	0.77
0-10 km from Gothenburg	-0.014	0.18	-0.010	0.59	-0.036	0.05	0.000	0.99
10-50 km from Gothenburg	-0.040	0.00	-0.034	0.07	-0.063	0.00	-0.015	0.41

50-100 km from Gothenburg	-0.028	0.00	-0.023	0.18	-0.040	0.02	-0.017	0.31
Other areas	-0.038	0.00	-0.027	0.09	-0.058	0.00	-0.025	0.11
<b>Industrial employment</b>								
Low	ref		ref		ref		ref	
Medium	0.005	0.01	0.000	0.92	0.004	0.23	0.012	0.00
High	0.004	0.11	-0.002	0.65	0.005	0.28	0.013	0.00
<b>Education</b>								
Low	ref		ref		ref		ref	
Medium	0.004	0.01	0.002	0.47	-0.001	0.60	0.007	0.01
High	0.001	0.46	0.002	0.54	-0.009	0.01	0.000	0.92
<b>Agricultural employment</b>								
Low	ref		ref		ref		ref	
Medium	-0.005	0.00	-0.007	0.01	-0.002	0.49	-0.007	0.03
High	-0.010	0.00	-0.010	0.02	-0.005	0.23	-0.010	0.01
<b>Migration</b>								
Low	ref		ref		ref		ref	
Medium	-0.004	0.04	-0.002	0.51	-0.006	0.06	-0.003	0.32
High	0.001	0.62	0.000	0.92	-0.001	0.87	0.004	0.37
<b>County</b>								
Stockholm	ref		ref		ref		ref	
Uppsala	0.022	0.00	0.030	0.02	0.016	0.18	0.022	0.08
Södermanland	0.041	0.00	0.059	0.00	0.040	0.00	0.026	0.03
Östergötland	0.030	0.00	0.032	0.03	0.036	0.01	0.023	0.11
Jönköping	0.021	0.02	0.028	0.08	0.033	0.04	0.003	0.86
Kronoberg	0.027	0.00	0.027	0.10	0.033	0.04	0.023	0.16
Kalmar	0.015	0.10	0.019	0.22	0.023	0.14	0.002	0.88
Gotland	-0.002	0.86	0.002	0.92	-0.001	0.96	-0.001	0.95
Blekinge	0.037	0.00	0.035	0.03	0.043	0.01	0.034	0.04
Kristianstad	0.021	0.06	0.021	0.29	0.031	0.12	0.012	0.56
Malmöhus	0.015	0.22	0.027	0.20	0.021	0.32	-0.004	0.87
Halland	0.009	0.35	0.018	0.29	0.011	0.51	-0.003	0.87
Göteborg and Bohus	0.015	0.11	0.016	0.34	0.024	0.15	0.006	0.70
Älvsborg	0.012	0.20	0.015	0.36	0.015	0.36	0.006	0.72
Skaraborg	0.033	0.00	0.045	0.01	0.039	0.01	0.013	0.42
Värmland	0.018	0.05	0.032	0.04	0.023	0.14	-0.002	0.92
Örebro	0.033	0.00	0.049	0.00	0.047	0.00	0.004	0.79
Västmanland	0.043	0.00	0.061	0.00	0.044	0.00	0.027	0.05

Kopparberg	0.059	0.00	0.091	0.00	0.064	0.00	0.025	0.10
Gävleborg	0.038	0.00	0.060	0.00	0.041	0.01	0.014	0.35
Västernorrland	0.007	0.45	0.036	0.03	0.012	0.42	-0.027	0.09
Jämtland	-0.030	0.00	-0.007	0.67	-0.016	0.32	-0.063	0.00
Västerbotten	0.014	0.13	0.033	0.05	0.015	0.34	-0.002	0.92
Norrbotten	0.010	0.31	0.032	0.06	0.015	0.37	-0.009	0.55
Constant	-1.560	0.00	-1.576	0.00	-1.841	0.00	-1.267	0.00
N	659,896		212,823		221,937		225,136	
F	260.0	0.00	90.2	0.00	99.6	0.00	85.86	0.00
R <sup>2</sup>	0.018		0.02		0.02		0.02	

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*Source:* See Table 1.