Is it who you are or where you live? Community effects on fertility behavior during the demographic transition in Sweden: A multi-level analysis using micro census data

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Abstract

The aim of this paper is to study contextual effects on fertility to obtain empirical evidence that the community in which individuals lived had an independent effect on their fertility behavior over and above their individual characteristics. This aim connects with hypotheses regarding the importance of innovation-diffusion in the process of the fertility decline. Using micro-census data for Sweden from 1880, 1890, and 1900, we use multilevel analysis to estimate measures of variance over time. Our findings reveal that it is *who you are rather than where you live* that explains fertility behavior during the transition.

Keywords: fertility transition; geographical differences, innovation-diffusion, adjustment, intra-class correlation.

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Introduction

Together with the mortality decline, the fertility transition is one of history's greatest discontinuities, a change similar in magnitude to the industrial or Neolithic revolutions, with enormous impacts on the lives of ordinary people. Certain recent scholarship has even considered it an important trigger for the transition from Malthusian stagnation to modern economic growth (Galor 2011; see also Guinnane 2011). Attempting to describe and explain this process has also been one of the main tasks of demographers and economic historians. Large-scale projects such as the European Fertility Project (EFP) have made substantial contributions to our understanding of the fertility transition, but considerable controversy remains, and much of the empirical picture is blurred. There has long been a debate over whether the transition was primarily a response to changing socioeconomic structural conditions (adjustment) or a result of new attitudes, norms and behaviors spreading at approximately the same time in many regions of Europe (innovation diffusion) (Carlsson 1966). Empirical evidence has been obtained in support of both views, although the EFP has largely dismissed the adjustment explanations (see, e.g., Coale and Watkins 1986; Cleland and Wilson 1985; Galloway, Lee and Hammel 1994; Brown and Guinnane 2002; Dribe 2009).

It has proven especially difficult to empirically corroborate the innovation-diffusion theory more directly. In the EFP, such support was to a large extent indirect, in that the aggregate-level relationships between socioeconomic change and mortality decline on the one hand and fertility change on the other were largely missing (Coale and Watkins 1986; Cleland and Wilson 1985; see, however, the methodological critique by Brown and Guinnane 2007). The findings on linguistic differences and secularization in Belgium obtained by Lesthaeghe (1977) can perhaps be considered more direct, and there is also some direct empirical support from voting data indicating an important role of attitudes and norms in the historic decline in fertility (Galloway, Lee and Hammel 1994; Brown and Guinnane 2002). Bocquet-Appel and Jacobi (1998) found evidence for a spatial diffusion process in the British fertility decline, using measures of spatial clustering. The adoption of family limitation (measured by change in the Ig index) was not simultaneous across the country but followed a clear spatial pattern similar to a contagious process. Moreover, in the work by Szreter (1996) on the British census of 1911, the role of socioeconomic factors was downplayed in favor of an emphasis on attitudes and discourse, which substantially depended on geography as much as class (see, however, the recent re-analysis by Barnes and Guinnane 2011).

At least implicitly, innovation diffusion is often connected to geographic differences and notions of community influence on fertility behavior. Few attempts have been made, however, to empirically substantiate such claims. The aim of this paper is to study fertility behavior during the early phase of the fertility transition in Sweden by applying multi-level models to micro-level census data covering the entire population (100% samples from three different censuses). The concept is to examine general contextual effects on fertility behavior to obtain empirical evidence that the communities in which individuals resided had an independent effect on their fertility. In other words, we ask whether the community had an independent impact on fertility behavior in addition to measurable individual- and family-level variables, an impact that could offer support for well-established hypotheses on the importance of innovation-diffusion in the process of fertility decline. Thus, community is clearly linked to geography in this study, and we will not capture networks stretching over vast distances and the impact they may have had on individual behavior, but we instead focus on the impact of the geographical communities in which individuals actually lived and interacted with one another. We argue that the historical parishes reflect these types of communities.

The remainder of the paper is structured as follows: the next section provides a background on innovation diffusion as an explanation for the fertility decline and how it can be expected to be connected to community-level effects, followed by a description of the data and methods and a presentation of the results.

Background

In a classic article, Swedish sociologist Gösta Carlsson (1966) distinguished between innovation and adjustment as the main processes or explanations of the fertility decline. While this framework was subsequently extended and refined in various ways, e.g., the supply-demand framework developed by Easterlin (1975; Easterlin and Crimins 1985) or the 'Ready-Willing-Able' model developed by Coale (1973; see also Lesthaeghe and Vanderhoeft 2001), the basic distinction between innovation-based and adjustment-based explanations has survived. By adjustment, we mean factors encouraging families to change their behavior to conform to new socioeconomic and demographic conditions for childbearing and family life. A long research tradition has attempted to explain the historic fertility transition as such an adjustment to the new conditions created by the mortality decline, industrialization and urbanization, dating back at least to the theory of the demographic transition (Davis 1945; Notestein 1945, see also Guinnane 2011 for a review and discussion).

Some authors are critical of regarding innovation and adjustment as alternative, or competing, theories of fertility change and argue for blended models in which innovation diffusion occurs in conjunction with structural change affecting the demand for and supply of children (see Casterline 2001; Cleland 2001; Palloni 2001). In other words, innovation diffusion cannot occur unless preferences for lower fertility are already in place. Coale proposed three necessary conditions for fertility to change, namely that individuals were ready, willing and able to do so (Coale 1973, see also Lesthaeghe and Vanderhoeft 2001). Readiness means that families must be prepared to make rational decisions regarding fertility; willingness is connected to the costs and benefits of having children; and ability is related to an awareness of methods to limit fertility. Scholars emphasizing the role of ideational factors in explaining the decline generally argue that while both willingness and ability existed before the transition, readiness did not. Ideational factors, or the diffusion of new attitudes toward family limitation, were instrumental in producing a rapid diffusion of family limitation across Europe (see Coale 1973; Coale and Watkins 1986; Cleland 2001; Cleland and Wilson 1987; Lesthaeghe 1980; Lesthaeghe and Wilson 1986).

Thus, according to these perspectives, some type of diffusion of new attitudes and behavior played an important role in the fertility transition. These attitudes created social acceptance for family limitation within marriage. Most likely, knowledge of contraception was not of prime importance, as at least basic knowledge of these matters was available to persons in the past (McLaren 1990; Santow 1995) and was practiced occasionally, for example in periods of economic hardship (Bengtsson and Dribe 2006; Dribe and Scalone 2010). Instead, the innovation regarded changing moral codes and the reduced influence of religion over belief systems and reproduction (Lesthaeghe and Surkyn 1988; Lesthaeghe 1980).

Diffusion of new fertility behavior can be regarded as similar to the diffusion of other types of innovative behavior. In geography, these sorts of diffusion processes are often considered strongly spatially determined, intimately linked both to the spread of information and barriers to the acceptance of new ideas (e.g., Hägerstrand 1953). In a classic study, first published in 1962, Rogers (2003) outlined a theory of innovation diffusion in which he contended that changes in attitudes toward an idea operate through interpersonal communication within a social system. The social system has a social structure that, through norms, establishes the expected behavior of its members. Innovation diffusion occurs most easily within a homophilous group (i.e., between individuals who share certain characteristics) because communication among them is more efficient. The spread of genuinely novel ideas, however, often requires a certain degree of heterophily (Rogers, 2003:36). This explains why certain groups within a social system adopt the new ideas earlier than others, and linked to this, five groups can be identified in the diffusion process: innovators, early adopters, early majority, late majority, and laggards. Innovations were thought to diffuse throughout social systems (i.e., a set of interrelated units), and the propensity for innovation was also positively associated with socioeconomic status, with innovators belonging to the highest socioeconomic status groups and the laggards having the lowest socioeconomic status (Rogers 1962:282).

The notion of a social system is related to the understanding of community developed by the sociologist Tönnies who, precisely studying the modernization process, distinguished between community (*Gemeinschaft*) and society (*Gesellschaft*). While modern society is characterized by promoting individualization, a community, conversely, is defined by social bonds and institutions, such as the church or the family, which promote social cohesion. In this context, the community may influence reproductive behavior by either creating structural opportunities to engage in a particular behavior or giving rise to social preferences that apply generally. The adoption of new behaviors not only depends on the actor’s own situation or characteristics but also on the behaviors of other immediate actors (Hedström, 1994). Thus, although community is not necessarily linked to any particular geographical or spatial level, the community and certain levels of geography may overlap, especially in historical eras when the way individuals related to their peer networks was more influenced by proximity. In this sense, the historic fertility transition was quite different from that in the developing world, where rapid and efficient communications might well have had an important impact on changing attitudes toward family and childbearing (see Caldwell 1982; Hornik and McAnany 2001).

Thus, controlling for socioeconomic status and age, we would expect certain areas to adopt the new behaviors earlier than others. Based on previous research, we also know that there were substantial geographical differences in the fertility decline within countries after controlling for compositional differences in social structure, age, etc. (see, e.g., Garreth et al. 2001; Dribe and Scalone, 2014) because, as Szreter (1996) argued, the new reproductive discourse spread not only socially but also geographically, producing strong geographic differences in fertility during the decline. Comparing England and France, for example, Lesthaeghe (1980) discussed regional differences in the decline in terms of different local subcultures related to secularization. These subcultures were assumed to have exerted considerable influence over the reproductive decisions of families, thereby having a direct impact on the timing of the fertility decline. Innovation diffusion can, in this way, be regarded as a social contagion process, or what Rosero-Bixby and Casterline (1993) term endogenous feedback. Individual fertility behavior is believed to be affected by the behavior of other persons in one's social networks, either through social learning (the spread of knowledge through social interaction) or social influence (certain individuals having a direct influence on the behavior of others through power and authority) (see Casterline 2001; Palloni 2001; Kohler 2001). The crucial question is, what constitutes a social network? Clearly, it is much more than living in a certain community, although geographical proximity must be part of it, especially in contexts in which the mass media is not well developed and large-scale information flows are inefficient (cf. Hägerstrand 1953; Montgomery and Casterline 1993). Under such conditions, that the development of local sub-cultures could be expected, implying that the community of residence (municipality, parish, neighborhood, etc.) might have exerted a strong influence on individual behavior. In other words, the local environment in which individuals and families live is often assumed to be an important determinant of fertility behavior, in conjunction with more standard socioeconomic determinants (Hammel 1990; Kohler 2001; Watkins 1990). Early adoption of family limitation by certain individuals in the community will affect others, as local norms and attitudes will likely change. Empirical confirmations have been obtained using panel regression methods for different contexts in the developing world (e.g., Rosero-Bixby and Casterline 1994; Montgomery and Casterline 1993). In addition, contextual variables reflecting socioeconomic and demographic conditions at the community level have also been found to be important in both historical and contemporary developing contexts (e.g., Hirschman and Young 2000; Dribe, Hacker, and Scalone, 2014).

Historical empirical evidence may support the statement that geographical differences represent a community, and therefore a level at which innovation-diffusion operates. However, a lack of data capturing the cultural dimension has been regarded as a limitation. Studies performed using contemporary data, which on the contrary have available information on cultural expectations, seem to confirm this hypothesis. A project conducted in Scotland using contemporary data has shown that fertility attitudes and expectations vary depending on where individuals live (Boyle et al., 2007). Therefore, if the existence of these differences can be interpreted in the present (i.e., in the context of an individualized society) as a possible level at which innovation-diffusion operates, we believe that the effect of the context may be even clearer in historical periods, as long distances and limited mass media would have been determining factors in the definition of community and, therefore, in the diffusion of new attitudes.

In this study, we operationalize community by parish of residence. Originally, the parish was a clerical unit organized around a church. Thus, parishioners shared the same clergy, which could have been important for innovations regarding birth control. Moreover, attending the same church every Sunday meant that individuals socialized with other parishioners on a regular basis, which provided an arena for social influence. The parish also addressed issues such as poor relief and schooling, and the parishioners interacted at the parish assembly (*sockenstämman*), discussing these and other matters (see, e.g., Aronsson 1992). This makes the parish a theoretically relevant unit for studying the impact of social interaction or culture (cf. Watkins 1990). In this regard, although the parish has gradually lost its meaning over time in view of the process of rationalization inherent to modernization, it may accurately represent the notion of *Gemeinschaft* formulated by Ferdinand Tönnies (1887).

In this paper, we study the importance of community-level influence on individual fertility behavior over and above individual characteristics. We are interested in analyzing the difference that place makes in understanding the fertility decline beyond what is in a place (composition). We believe that the community affects fertility behavior when individuals belonging to a certain community are more similar to one another in their reproductive behavior than individuals living in another community. Therefore, this statement suggests that *within*-community variation is fundamental to understanding the relevance of the community in determining fertility behaviors. When exploring differences in fertility by community using information from the coefficients obtained from any standard regression analysis, we only assess population-average fertility differences by community. However, population-average differences can mask informative information on individual variation (Merlo et al. 2013). Therefore, together with measures of population-average associations, we need to include measures of individual variation (i.e., intra-class correlation) to determine the correlation existing within a community with respect to the phenomenon under study.

The multilevel modeling we employ to study contextual effects on fertility is a suitable method to estimate measures of individual variation, which inform us of the extent to which individuals *within* a community are homogenous with respect to the behavior studied. Contemporary studies have observed relatively large general contextual effects when studying educational outcomes of pupils in a school class sharing the same teacher or the health outcomes of individuals belonging to different primary health care units (Sellström et al., 2006; Reeves et al., 2010). Similarly, we assess whether community matters in its own right with respect to understanding fertility decisions.

We study general contextual effects at the community level over time (1880, 1890 and 1900), as we expect that the effect of community may vary over time. We hypothesize that attitudes toward fertility behavior may be less affected by the community over time as individualistic values become more common. The period under study covers the most important part of the fertility transition in Sweden and therefore provides us with a great opportunity to study innovation-diffusion theory in this context. Further, we hypothesize that the effect of the community on fertility behavior varies depending on the socioeconomic group in question, to the extent that the elite may be less constrained by proximity and, therefore, more prone to be exposed to new ideas crossing community borders. Therefore, we expect that the community modifies the individual-level association between socioeconomic status and fertility.

Data

We use micro-level data from three different Swedish censuses (1880, 1890 and 1900). These data were digitized by the Swedish National Archives and published by the North Atlantic Population Project (NAPP, see Ruggles et al. 2011; Sobek et al. 2011), which employs the same format as the Integrated Public Use Microdata Series (IPUMS). All registered individuals are grouped by household. In this way, each individual record reports the household index number and the personal index number within the household. The age, marital status and sex of each person are also registered. Migration status distinguishes whether a person was born in the same county of residence or in another county or country. There are family pointer variables indicating the personal number of the mother, father, or spouse within the household, making it possible to link each woman to her children and husband. In total, the 1880 census counts approximately 4.6 million persons in 1.2 million households from 2,530 parishes in 24 counties, while the corresponding figures in the 1890 and 1900 censuses are 4.8/1.3 and 5.2/1.4 million, respectively.

We measure fertility by the number of own children under five living in the household rather than the number of children ever born. We also limit the sample to currently married women with their spouses present. It is therefore an analysis of net marital fertility, or reproduction, rather than an analysis of marital fertility. In a previous study, we compared this type of child-woman ratio to other standard fertility measures (e.g., TMFR), as well as to another indirect method (the own-children method). We demonstrated that the unadjusted child-woman ratio indicated socioeconomic differentials in gross, or total, fertility reasonably well (Scalone and Dribe 2012; see also Dribe and Scalone 2014). In many ways, this is a more informative measure of fertility, as we expect the number of children surviving to have been what families cared about, rather than number of births. Although some of the fertility transition came about to offset reduced mortality (e.g., Galloway, Lee and Hammel 1998; Reher 1999; Reher and Sanz-Gimeno 2007; see also Dyson 2010), it is obvious that the decline in net-fertility was much more important in the long run (Haines 1998).

Descriptive statistics of the three census datasets are presented in Table 1. We have approximately 600,000 married women (aged 15-54) in each census. The analysis includes measures at the individual and family levels and the county and parish levels. We measure socioeconomic status by the occupation of the husband. All occupational notations were coded in HISCO (Van Leeuwen, Maas and Miles 2002) within the SweCens project of the Swedish National Archives. Based on HISCO, we classified occupations into different classes following HISCLASS, which is a 12-category classification scheme based on skill level, the degree of supervision, whether manual or non-manual, and whether urban or rural (Van Leeuven and Maas 2011). It contains the following classes: 1) Higher managers, 2) Higher professionals, 3) Lower managers, 4) Lower professionals and 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. Circa 1880, approximately 41% belonged to the farmer group, while this figure declined to 38% in 1890 and 32% in 1900. A similar decrease occurred for farm workers, whereas the proportion of skilled workers, managers and professionals increased.

[Table 1 here]

It is not straightforward to measure the employment status of the woman because of the problem of farming. Including all wives in the farming sector as employed would yield much higher estimates than those presented here, where we have only included occupations noted in the sources (i.e., not the wife). For example, only approximately half of one percent of all married women in the age group 15-54 was gainfully employed outside the farm circa 1900 (see Table 1). According to the 1920 census, the corresponding figure was 4% (Silenstam 1970:56). Most likely, a large number of married women performed various types of work to supplement family income without this being recorded in the sources.

We include four different community-level indicators measured at both the county and parish levels: the proportion of industrial workers in the male population aged 15-64; the number of teachers in basic education per 100 children of school age (7–14); the number of single women participating in the labor force relative to the unmarried female population aged 15–64; and the proportion of in-migrants from early-decline counties in the total population. All counties in 1880, 1890 and 1900 with a Coale-Trussel "m" greater than 0.2 (which is commonly taken to indicate the presence of parity-specific birth control) were considered early-transition counties (Coale and Trussel 1974, 1978; data from Dribe 2009). To account for possible non-linear effects, we transform these indicators into a categorical variable for low (first quartile), middle (second and third quartiles) and high (forth quartile) levels.

Methods

We apply Multilevel Linear Regression Analysis (MLRA) to model the number of surviving children (aged 0-4) of married women (aged 15-54) (first level) nested within parishes (second level) and parishes within counties (third level). We include the county level as a comparison, and if the hypothesis regarding strong community effects on fertility behavior were correct, we would expect much stronger contextual effects at the parish level than at the county level.

MLRA is an appropriate methodology for the analysis of hierarchical data (i.e., individuals nested within the same context) and a suitable method to distinguish between general and specific contextual effects (Duncan et al. 1998, Subramanian 2004), the former of which are expressed as measures of variance or intra-class correlation (Merlo, Yang et al. 2005; Merlo, Ohlsson et al. 2009). A measure of intra-class correlation provides us with an idea of the similarity existing between individuals who share a particular context and, therefore, provides the multi-level dimensions that exist behind the social phenomenon under study. Technically, by including a random-term intercept at the community level, MLRA estimates not only the difference between the levels of fertility (mean) in each community with respect to the national mean but also the individual variation exiting *within* the community with respect to the overall mean of the community.

We estimate three consecutive models. Model 1 (null model) only estimates the national average number of children per woman and the intercept variance at the mother (σ^2_{m}), parish (σ^2_{mp}) and county (σ^2_{mco}) levels. MLRA accounts for the interdependence of observations by partitioning the total variance into the different components (levels) studied (Browne, Subramanian et al. 2005; Merlo, Basile et al. 2005).

Level 1: $Y_{ijk} = \beta_{0jk} + e_{0ijk}$

Level 2: $\beta_{0jk} = \gamma_{00k} + u_{0jk}$

Level 3: $\gamma_{00k} = \psi_{000} + v_{0k}$

Where Y_{ijk} is the number of children per woman for individual *i* in parish *j* and county *k;* β_{0jk}; γ_{00k} and ψ_{000} are random intercepts for level 1 (mother), level 2 (parish) and level 3 (counties), respectively; and e_{0ijk}, u_{0jk} and v_{0k} are level 1, 2 and 3 random effects, respectively.

Model 2 is extends model 1 by including individual variables as fixed effects to account for possible compositional confounding and to obtain a better estimation of the variance in the number of children between parishes and counties.

Level 1: $Y_{ijk} = \beta_{0jk} + \beta_{1jk}\mathbf{X}_{ijk} + e_{0ijk}$

Level 2: $\beta_{0jk} = \gamma_{00k} + u_{0jk}$

Level 3: $\gamma_{00k} = \psi_{000} + v_{0k}$

Where $\beta_{1jk}\,\mathbf{X}_{ijk}$ are level 1(individual) predictors (see table 1).

Model 3 includes contextual information at the parish and county levels as a fixed effect.

$$\text{Level 1:}\quad Y_{ijk} = \beta_{0jk} + \beta_{1jk}\,\mathbf{X}_{ijk} + e_{0ijk}$$
$$\text{Level 2:}\quad \beta_{0jk} = \gamma_{00k} + \gamma_{01k}\mathbf{W}_{jk} + u_{0jk}$$
$$\text{Level 3:}\quad \gamma_{00k} = \psi_{000} + \psi_{001}\mathbf{Z}_{k} + v_{0k}$$

Where $\gamma_{01k}\mathbf{W}_{jk}$ and $\psi_{001}\mathbf{Z}_k$ are level 2 (parish) and level 3 (county) predictors, respectively (see table 1).

To assess the possibility that the effect of community on fertility varies across socioeconomic groups, we also estimated a set of random slope models to estimate the variance at the parish level as a function of socioeconomic status (SES), previously categorized into high and low SES.

To estimate the models, we use Restricted Generalized Least Squares (RIGLS) (Goldstein, 1989). To assess the extent to which each level of analysis (mother, parish and county) explains the individual differences in the number of children per woman (i.e., the 'importance' of each level in understanding the differences in the number of children per woman), we calculate the Variance Partition Coefficient (VPC) as follows for each level of analysis. VPC is a measure of the proportion of the total variance in the number of children per woman that is explained at each particular level:

$$VPC_{\text{maternal county (mco)}} = (\sigma^2_{mco} / (\sigma^2_{mco} + \sigma^2_{mp} + \sigma^2_{m})) *100$$
$$VPC_{\text{maternal parish(mp)}} = (\sigma^2_{mp} / (\sigma^2_{mco} + \sigma^2_{mp} + \sigma^2_{m})) *100$$
$$VPC_{\text{mother(m)}} = (\sigma^2_{m} / (\sigma^2_{mco} + \sigma^2_{mp} + \sigma^2_{m})) *100$$

Where σ^2_{m}, σ^2_{mp} and σ^2_{mco} are the variances at the mother, parish, and county level, respectively.

Given the hierarchical structure of our data, we can also estimate a measure of intra-class correlation (ICC) for the contextual levels under study. ICC provides information on the correlation in the number of children between mothers randomly taken from the same parish or county of residence (Merlo, Basile et al. 2005):

$$ICC_{\text{maternal county (mco)}} = (\sigma^2_{mco} / (\sigma^2_{mco} + \sigma^2_{mp} + \sigma^2_{m})) *100$$
$$ICC_{\text{maternal parish(mp)}} = (\sigma^2_{mp+}\ \sigma^2_{mco} / (\sigma^2_{mco} + \sigma^2_{mp} + \sigma^2_{m})) *100$$

We also calculate the Proportional Change in Variance (PCV) to assess the extent to which differences in the number of children are attributable to geographical influences or differences in the individual and contextual composition of the geographic units (Merlo, Yang et al. 2005). In other words, it provides a magnitude (percentage) of variance that decreases after including additional variables in the model. The PCV is obtained as follows:

$$PVC_{mco} = ((\sigma^2_{mco\text{-}model\_null} - \sigma^2_{mco\text{-}model\_co}) / \sigma^2_{mco\text{-}model\_null}) *100$$
$$PVC_{mp} = ((\sigma^2_{mp\text{-}model\_null} - \sigma^2_{mp\text{-}\ model\_co}) / \sigma^2_{mp\text{-}model\_null}) *100$$
$$PVC_{mother} = ((\sigma^2_{m\text{-}model\_null} - \sigma^2_{m\text{-}\ model\_co}) / \sigma^2_{m\text{-}model\_null}) *100$$

Where $\sigma^2_{m\_model\_null}$, $\sigma^2_{mp\_model\_null}$, and $\sigma^2_{mco\_model\_null}$ are the variances at the mother, parish, and county level estimated respectively for the null models, and $\sigma^2_{m\_model\_co}$, $\sigma^2_{mp\_model\_co}$, and $\sigma^2_{mco\_model\_co}$ are the corresponding variances estimated for the models including additional variables.

We also plot the shrunken parish- and county-level residuals. Shrunken residuals are calculated by multiplying the row residuals at each level by a “shrinkage factor”, which is (for the parish level) the parish variance divided by the parish-level variance plus the level-one variance over the number of individuals in the parish:

$$\text{Shrinkage factor} = \sigma^2_{mp} / \sigma^2_{mp} + (\sigma^2_{m}/n_j)$$

The shrunken residuals reveal how each specific geographical area (parish or county) differs from the overall country mean (Rasbash et al. 2012). The analyses are performed using the statistical package MLWIN 2.26 (Centre for Multilevel Modelling, University of Bristol, UK).

Results

Before turning to our main analysis, some brief comments will be made regarding the fixed component of the model (all estimates are displayed in appendix table A1). Overall, the individual-level variables have the expected signs, and the magnitudes are also quite sizable. For example, higher socioeconomic status is related to lower net fertility, although there is not a perfect gradient. The upper and upper-middle classes experience an earlier decline than the working classes, and this difference persists throughout the early phase of the fertility decline. Employed women have lower net fertility than women without a registered occupation, and in most cases, migrants have lower net fertility than non-migrants. The community-level variables also have the expected signs in most cases, but the coefficients are generally small, indicating a weak association between observable factors at the parish and county levels on the one hand and net fertility on the other.

Turning to the main focus of our analysis, figures 1-3 depict the mother's parish and county of residence ranked according to their average number of children (0-4) per woman for the null and the full model for each year (1880, 1890 and 1900). The overall population average is represented by a grey horizontal line, and the shrunken residuals and their 95% confidence intervals for each parish and county obtained from the multilevel regression are represented by vertical lines. In all cases, most parishes and counties differ on average from the national mean, which suggests a geographical variability in the number of children per woman across the country. Following the innovation-diffusion explanation, the areas with high fertility levels are assumed to have taken longer to adopt birth control strategies than those with low levels. Without assessing measures of variation, this result may suggest the existence of community effects on fertility.

[Figures 1-3 here]

As expected, once adjusted by individual and contextual characteristics, the average number of children per woman between parishes and counties are closer to the mean of Sweden, and their confidence intervals are larger than in the null model (i.e., parishes and counties are more similar). This is the case because part of the differences found between areas in the null model is due to compositional differences between them. However, although some confidence intervals overlap, there are still statistically significant differences between certain parishes and counties. This pattern holds for all three census years (see figures 1-3).

Despite the differences observed on average between geographical units, these differences do not inform us of the variability existing within these units (i.e., the extent to which the individuals belonging to a certain community are similar to one another). To measure intra-class parish correlation, we calculated a measure of intra-class correlation (ICC) from the random components. Table 2 presents a set of multilevel models predicting the number of children per woman. The table reports the average number of children per woman (intercept) and the components of the variance at the three levels of analysis (i.e., random effects) for each model specification and census year.

[Table 2 here]

The ICC calculated for model 1 indicates that the correlation between individuals belonging to the same community is nearly 2% (ICC_{1880}= 1.82%; ICC_{1890}= 1.97%; ICC_{1900}= 1.97%). In the same vein, the parish level explained less than 1% of the differences in the number of children per woman (VPC_{1880}= 0.73%; VPC_{1890}= 0.81%; VPC_{1900}= 0.81), while the county explains approximately 1% of the differences (VPC_{1880}= 1.09%, VPC_{1890}= 1.16% and VPC_{1900}= 1.16%). These small percentages mean that while on average there are significant geographical differences at both the parish and county levels (see figures 1-3), there is also substantial individual variability within each of these geographical units. In other words, this means that the number of children per woman is primarily explained by the individual or family characteristics of the women who live in those areas ($VPC_{1880=}$ 98.18, VPC_{1890}= 98.03 and VPC_{1900}= 98.03%) rather than by community-level influence. The fact that the ICC for the parish level is as approximately identical to the ICC for the county level also contradicts the hypothesis of a strong, local community-level influence on fertility, as we expect this influence to have been most relevant at the parish level.

The inclusion of individual (model 2) or individual and contextual (model 3) variables does not considerably change these ICC results. However, the inclusion of individual variables in model 2 reduces the variance (see PVC in the tables) at the individual (in approximately 30% of units), parish (30-40% of units) and county levels (10-20% of units). This means that mother's characteristics were able to explain these percentages of the initial variance observed in the null model. In other words, this means that, for example, 30% (i.e., PVC_{1880}) of the total variance at the individual level in 1880 (i.e., $VPC_{1880=}$ 98.18%) was explained by the observed individual characteristics included in model 2, and consequently, the remaining 70% were not captured by them. Conversely, the inclusion of contextual variables in model 3 does not produce any change in the variance at the individual or parish level but explains 67% of the variance at the county level.

As expected, the effect of the community, over and above individual characteristics, varies across socioeconomic groups (table 3). In general, the intra-class correlation accounting for SES is slightly higher than the overall ICC estimated for the whole population without distinction (table 2), which suggests that the community modifies the individual-level association between socioeconomic status and fertility (cf. Dribe and Scalone, 2014). The ICC for the low socioeconomic group is slightly higher (i.e., ICC_{1880} =2.72) than that of the high socioeconomic group (ICC_{1880} =2.23). This means that the former are more alike in their reproductive behaviors within the community than high socioeconomic status individuals. Furthermore, the importance of the community in fertility increases over time in both groups but does so more clearly for low SES individuals (ICC_{1880} =2.72; ICC_{1890} =2.75; ICC_{1900} =3.08). Consistently, the percentage of the variance explained at the community level is slightly higher for the low SES (i.e., VPC_{1880} =1.19) compared to the high SES group (i.e., VPC_{1880} =0.68).

[Table 3 here]

In a cross-time comparison, we observed the same pattern mentioned above (i.e., a small share of the differences in fertility can be attributed to the community level). However, we also found that, within this small general contextual effect, there is a slight reduction in the percentage explained at the community level over time ($VPC_{1880=}$ 0.70, VPC_{1890}= 0.66 and

VPC_{1900}= 0.48%). This finding supports our hypothesis that attitudes toward fertility behavior are less affected by the community over time as individualistic values become more common.

Over time, the same observed maternal characteristics explain less of the variation in the number of children per woman ($PVC_{1880=}$ 30%; $PVC_{1890=}$ 29.49%; $PVC_{1890=}$ 27.36%) but more of the geographical variations at the parish ($PVC_{1880=}$33%; $PVC_{1890=}$42.86% and $PVC_{1890=}$ 42.86%) and county levels ($PVC_{1880=}$ 0%; $PVC_{1890=}$ 20% and $PVC_{1900=}$ 10%). This increase in the proportional change of variance (PVC) at the geographical level suggests that the variability observed in the null model is increasingly affected by its individual composition.

The inclusion of both individual and contextual variables at the parish and county levels (model 3) reduces the variance at the three levels compared to the null model, and as expected, their inclusion reduces the variance to a greater extent at the parish and county levels than in model 2 but does not affect the variance at the individual level. The observed contextual variables included in model 3 were able to explain between 33 and 57% of the variance at the parish level but between 67-80% at the county level.

It is interesting to note that the same contextual variables explain a larger proportion of the total variance at the county level in 1890 (PVC =80%) than in 1900 (PVC =70%), and the same result is observed in model 2 with respect to the inclusion of individual characteristics (PVC_{1890} =20% and PVC_{1900}= 10%).

To examine the extent to which the role of the parish varies across Sweden and therefore has a different effect on individual reproductive behavior, we perform a sensitivity analysis by restricting our sample to those parishes located in the southernmost province of Sweden (the Skåne region) where the importance of the parish as a community is beyond doubt. Our results (data not reported in the tables) are similar to those we obtained for the whole country (i.e., ICC-VPC <1%). Moreover, we performed a sensitivity analysis considering married women who had at least one child older than 5 living in the household to evaluate whether our main results captured women who were more reproductively active because they were beginning their reproductive lives. The results are consistent with the main results (i.e., ICC-VPC <1%).

Conclusion

Community can be expected to have been important for individual-level fertility behavior during the transition if individual action (i.e., the adoption of or resistance to new behaviors) not only depends on an individual's characteristics but also on contextual effects (as expressed by measures of individual variation). Establishing the existence of such a community-level influence on fertility would clearly offer strong support for innovation diffusion as a crucial aspect of the fertility transition, as it would suggest a prominent mechanism by which such diffusion occurred.

Our findings, however, do not provide a strong case for this type of community-level influence. While we found pronounced differences in average fertility between different areas, they were not the result of a community-level impact on individual behavior. Instead, fertility was almost exclusively determined by maternal (individual- and family-level) characteristics (approximately 98%), regardless of the community to which the mother belonged. This claim was supported by the small ICCs observed at the parish level, which suggest that only a negligible share of the number of children observed was attributable to true community effects. In other words, community-level factors had very little influence on the individual fertility decision because the intra-class correlation (i.e., similarity) between the individuals who lived in the same context was very small. Therefore, if we had moved a randomly selected woman from a high-fertility to a low-fertility context, according to our results, her fertility would have changed very little. In turn, this also implies that the mean differences in fertility between different localities were largely explained by compositional differences and not by some type of shared experiences operating at the community level. These factors could nevertheless be related to attitudes and norms. The important conclusion is that they primarily operated at the individual level and not through some type of shared experiences at the community level.

Despite this general conclusion, we found that the effect of community on fertility varied depending on socioeconomic status, which implies that the community modified the relationship between SES and fertility behavior, which we have also shown in previous studies using a different methodology (Dribe and Scalone, 2014; Dribe, Hacker and Scalone, 2014). We observed that low socioeconomic status individuals were more similar to one another in their reproductive behaviors than their high socioeconomic status counterparts. This confirms the hypothesis that the elite were less constrained by proximity and, therefore, more receptive to new ideas crossing community borders. However, contrary to expectations, the effect of community increased in both groups over time.

Compared to contemporary studies of educational outcomes or health, our results suggest a much weaker impact of community on fertility outcomes than, for example, class or school on educational outcomes or health district or hospital for health outcomes (e.g., Yu and Thomas 2008; Sellström and Bremberg 2006; Reves et al. 2010). While in these contexts, the shared level could account for approximately 10-20% of total variation, in our case it was 3% or less. In a school or a hospital district, it is of course much more obvious that more is being shared than merely an administrative area such as a parish or a county, although we argued that the parish was a real community in this period in terms of social interaction.

Further analysis is needed in other historical contexts to confirm whether this is a particularity of the Swedish case or a general historical phenomenon. Nonetheless, this is the first study that evaluates innovation-diffusion theory from a multilevel perspective in a historical context. Our results do not necessarily exclude innovation diffusion as an important explanation for the fertility decline, but they do question the level at which it operates. What we suggest is that *who you are* rather *where you live* explained fertility decisions in the early stages of the fertility transition. To the extent that ideational factors were important, they must have primarily operated at the individual level, e.g., through social stratification systems or other social networks, rather than between geographic areas. The community as such seems to have played much less of a role in reproductive outcomes during this phase of the transition.

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Table 1. Child woman ratio and distribution of covariates (%) by year.

	1880	1890	1900
Child Woman ratio	0.87	0.89	0.85
Individual level variables			
SES			
Higher managers	1.6	2.1	2.2
Higher professionals	1.0	1.0	1.2
Lower managers	2.5	2.1	2.6
Lower professionals	2.8	3.4	4.2
Lower clerical and sales personnel	0.8	0.9	1.3
Foremen	1.5	2.3	2.5
Medium skilled workers	9.4	11.2	13
Farmers and fishermen	41.2	37.5	32.4
Lower skilled workers	6.8	9.2	11.9
Lower skilled farm workers	1.3	1.6	1.8
Unskilled workers	9.0	8.7	8.3
Unskilled farm workers	15.2	14.3	13.4
N.A.	6.9	5.5	5.1
Age of woman			
15-19	0.4	0.4	0.4
20-24	6.0	5.4	6.5
25-29	13.5	14.1	13.6
30-34	16.7	17.9	15.8
35-39	17.7	17.3	18.2
40-44	16.2	16.2	17.4
45-49	15.7	15.4	15
50-54	13.7	13.2	13
Age difference between spouses			
Wife older	27.9	26.9	26.0
Husband 0-2 older	21.3	22.0	22.7
Husband 3-6 older	25.1	25.6	26.3
Husband>6 older	25.6	25.6	24.9
Children>4 years at home			
No	30.9	29.9	29.6
Yes	69.1	70.1	70.4
Woman employed			
No	99.6	99.5	99.4
Yes	0.4	0.5	0.6

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	1880	1890	1900
Migrant status of the couple			
Both migrants	10.0	12.4	13.9
Wife migrant, husband non-migrant	7.8	8.6	9.8
Wife non-migrant, husband migrant	9.5	10.2	10.9
Both non-migrants	72.6	68.8	65.3
Parish- level variables			
Industrial employment			
Low (1st quartile)	19.5	17.9	15.8
Medium (2nd and 3rd quartiles)	44.5	40.9	37.9
High (4th quartile)	36.0	41.2	46.3
Teachers/100 children 7-14			
Low (1st quartile)	22.0	22.3	23.8
Medium (2nd and 3rd quartiles)	58.3	56.3	56.3
High (4th quartile)	19.7	21.4	20
Female labour force participation			
Low (1st quartile)	25.1	24.1	22
Medium (2nd and 3rd quartiles)	48.9	48.1	45.4
High (4th quartile)	26.0	27.8	32.6
Place of residence			
Rural	85.5	81.6	79.5
Urban	14.5	18.4	20.5
Prop. migrants from early decline counties			
Low (1st quartile)	14.8	14.3	15.8
Medium (2nd and 3rd quartiles)	53.5	51.0	45.8
High (4th quartile)	31.8	34.7	38.4
County- level variables			
Education rate			
Low (1st quartile)	22.8	20.1	17.8
Medium (2nd and 3rd quartiles)	5.4	51.2	57.1
High (4th quartile)	17.8	28.7	25.1
Female labour force rate			
Low (1st quartile)	22.6	21.8	22.8
Medium (2nd and 3rd quartiles)	45.7	45.0	39.7
High (4th quartile)	31.7	33.1	37.4
Prop. migrants from early decline counties			
Low (1st quartile)	23.1	21.7	21.5
Medium (2nd and 3rd quartiles)	57.7	57.7	58.3
High (4th quartile)	19.3	20.5	20.3
N	580 849	586 918	619 096

Source: Micro-level census data, SweCens, The Swedish National Archives.

Table 2. Multilevel analyses modeling the number of children with mothers (first level) nested within parishes (second level) and parishes within counties (third level), 1880, 1890 and 1900

	1880			1890			1900		
	Model 1	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**	**Model 1**	**Model 2**	**Model 3**
Fixed effect part									
Mean NCW* of Sweden (intercept)	0.876	0.614	0.752	0.887	0.630	0.758	0.869	0.696	0.870
Random effect part									
Components of variance (SE)									
Variance between counties	0.009 (0.003)	0.009 (0.003)	0.003(0.001)	0.010 (0.003)	0.008 (0.002)	0.002(0.001)	0.010 (0.003)	0.009 (0.003)	0.003 (0.001)
Variance between parishes	0.006 (0.000)	0.004 (0.000)	0.004 (0.000)	0.007 (0.000)	0.004 (0.000)	0.004 (0.000)	0.007 (0.000)	0.004 (0.000)	0.003 (0.000)
Variance between individuals	0.810 (0.001)	0.567 (0.001)	0.567 (0.001)	0.847 (0.002)	0.598 (0.001)	0.598 (0.001)	0.848 (0.002)	0.616 (0.001)	0.616 (0.001)
Variance Partition Coefficient -VPC-									
VPC_{county}	1.09	1.55	0.52	1.16	1.31	0.33	1.16	1.43	0.48
VPC_{Parish}	0.73	0.69	0.70	0.81	0.66	0.66	0.81	0.63	0.48
VPC_{mother}	98.18	97.76	98.78	98.03	98.03	99.00	98.03	97.93	99.03
Intra-class Correlation -ICC-									
ICC_{county}	1.09	1.55	0.52	1.16	1.31	0.33	1.16	1.43	0.48
ICC_{Parish}	1.82	2.24	1.22	1.97	1.97	0.99	1.97	2.07	0.96
Proportional Change in Variance -PCV-									
by the new model									
PVC_{county}	ref	0.00	66.67	ref	20.00	80.00	ref	10.00	70.00
PVC_{Parish}	ref	33.33	33.33	ref	42.86	42.86	ref	42.86	57.14
PVC_{mother}	ref	30.00	30.00	ref	29.40	29.40	ref	27.36	27.36
Deviance **	1527900	207106	134	1570477	204922	140	1656880	198107	305
Number of observations	580,849	580,849	580,849	586,918	586,918	586,918	619,096	619,096	619,096

Model 1= null model; Model 2= Model with individual variables; Model 3= model with individual and contextual variables
*Number of children per women
** Change with respect to previous model

Source: Micro-level census data, SweCens, The Swedish National Archives.

Table 3. Multilevel analyses modeling the number of children with mothers (first level) nested within parishes (second level) and parishes within counties (third level), 1880, 1890 and 1900. Results from random slope models, estimating parishes' random effect as a function of socioeconomic status (SES)

	1880		1890		1900	
	Model 2	Model 3	Model 2	Model 3	Model 2	Model 3
Variance Partition Coefficient -VPC-						
VPC $_{Parish\_ low SES}$	1.19	1.04	1.45	0.65	1.70	0.78
VPC $_{Parish\_high SES}$	0.68	0.69	1.31	0.66	1.25	0.63
Intra-class Correlation -ICC-						
ICC $_{parish\_low SES}$	2.72	1.38	2.75	1.47	3.08	1.57
ICC $_{Parish\_high SES}$	2.23	1.04	1.95	0.82	2.18	0.94

Source: Micro-level census data, SweCens, The Swedish National Archives.

Figure 1. Differences in average number of children per women by county and parish of maternal residence (1880)

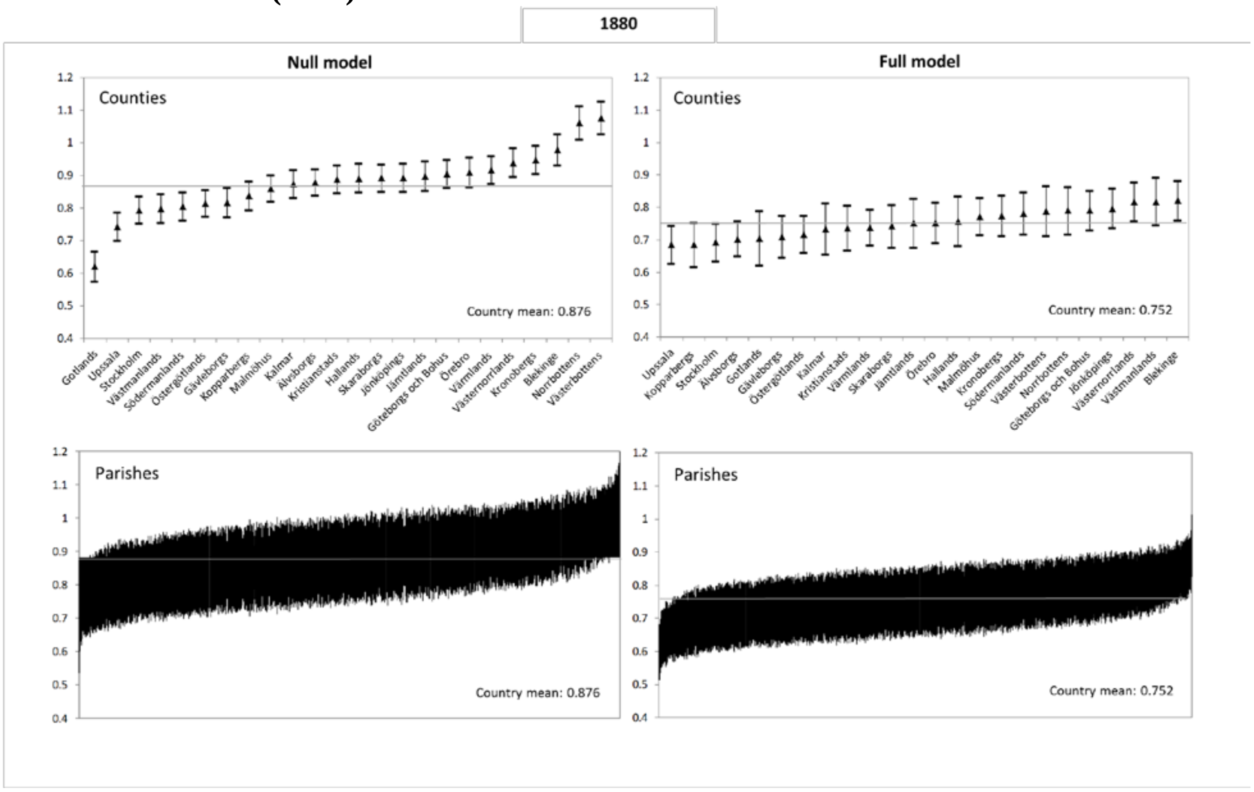


Figure 2. Differences in average number of children per women by county and parish of maternal residence (1890)

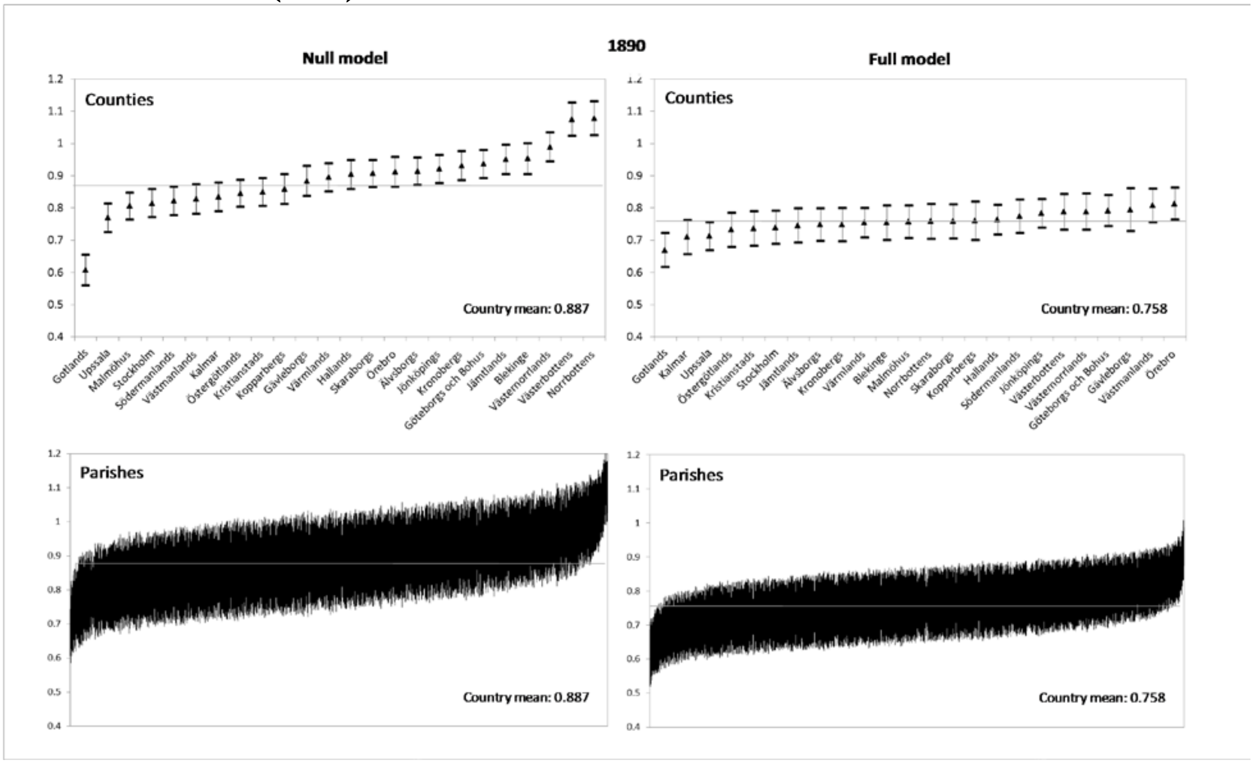
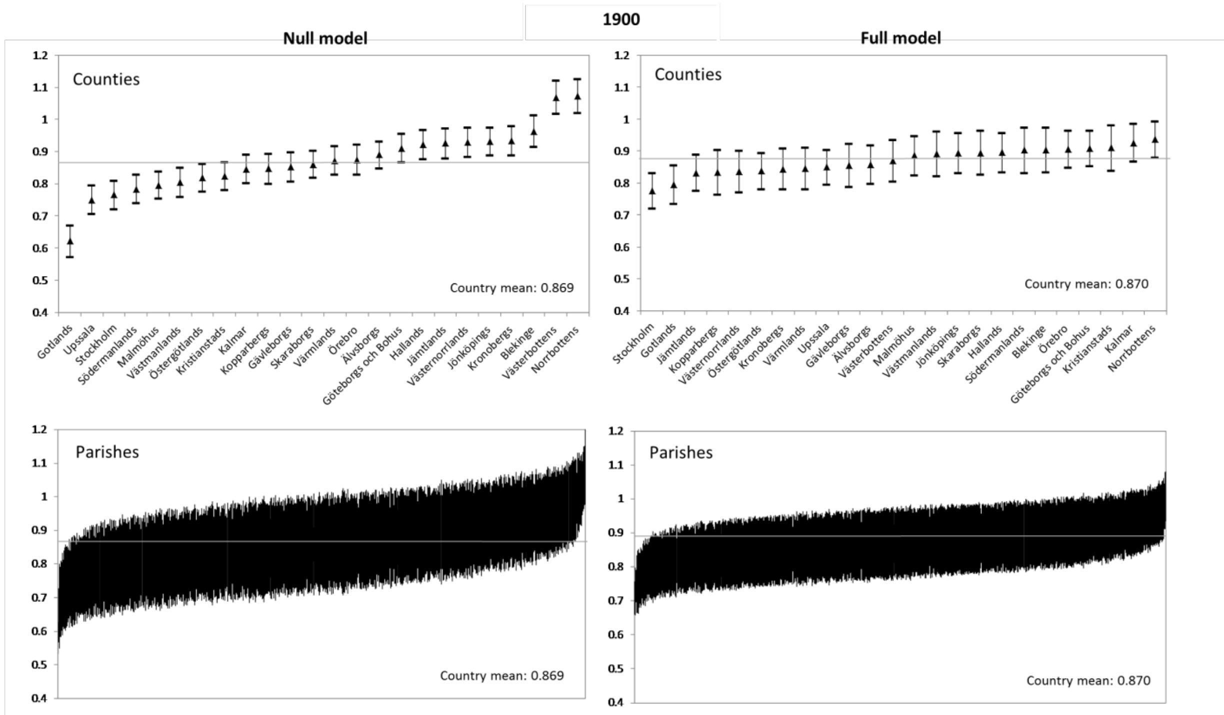


Figure 3. Differences in average number of children per women by county and parish of maternal residence (1900)



Appendix.

Table A.1. Multilevel analyses modeling the number of children with mothers (first level) nested within parishes (second level) and parishes within counties (third level), 1880, 1890 and 1900. Fixed part of the model

	1880						1890						1900					
	Model 2			Model 3			Model 2			Model 3			Model 2			Model 3		
	β		Std. Error	β		Std. Error	β		Std. Error	β		Std. Error	β		Std. Error	β		Std. Error
Individual level variables																		
SES																		
Higher managers (ref)																		
higher professionals	0.043	***	0.013	0.044	***	0.013	-0.070	***	0.012	-0.067	***	0.012	-0.082	***	0.011	-0.077	***	0.011
Lower managers	0.039	***	0.010	0.040	***	0.010	-0.080	***	0.010	-0.007		0.010	-0.030	***	0.009	-0.027	***	0.009
Lower professionals	0.049	***	0.010	0.051	***	0.010	-0.002		0.009	0.000		0.009	-0.044	***	0.009	-0.039	***	0.009
Lower clerical and personnel	0.008		0.014	0.011		0.014	-0.013		0.013	-0.009		0.013	-0.056	***	0.011	-0.050	***	0.011
Foremen	0.079	***	0.009	0.080	***	0.011	0.010		0.01	0.012		0.010	-0.020	**	0.010	-0.016	*	0.010
Medium skilled workers	0.088	***	0.009	0.089	***	0.009	0.077	***	0.008	0.079	***	0.008	0.060	***	0.008	0.064	***	0.008
Farmers and fishermen	0.054	***	0.008	0.052	***	0.008	0.048	***	0.007	0.046	***	0.007	-0.033	***	0.008	0.057	***	0.007
Lower skilled workers	0.107	***	0.009	0.108	***	0.009	0.096	***	0.008	0.097	***	0.008	0.381	***	0.016	0.088	***	0.008
Lower skilled farm workers	0.065	***	0.012	0.065	***	0.012	0.060	***	0.011	0.060	***	0.011	0.606	***	0.016	0.047	***	0.010
Unskilled workers	0.040	***	0.009	0.042	***	0.009	0.056	***	0.008	0.059	***	0.008	0.489	***	0.016	0.056	***	0.008
Unskilled farm workers	0.046	***	0.008	0.046	***	0.008	0.051	***	0.008	0.051	***	0.008	0.270	***	0.016	0.062	***	0.008
Non-SES	-0.024	***	0.009	-0.026	***	0.009	-0.047	***	0.008	0.060	***	0.011	-0.033	***	0.008	-0.032	***	0.008
Age mother																		
15-19																		
20-24	0.400	***	0.016	0.400	***	0.016	0.448	***	0.017	0.448	***	0.017	0.381	***	0.016	0.382	***	0.016
25-29	0.675	***	0.016	0.675	***	0.016	0.681	***	0.016	0.682	***	0.016	0.606	***	0.016	0.606	***	0.016
30-34	0.624	***	0.016	0.625	***	0.016	0.606	***	0.017	0.606	***	0.017	0.489	***	0.016	0.490	***	0.016
35-39	0.421	***	0.016	0.421	***	0.016	0.390	***	0.017	0.390	***	0.017	0.270	***	0.016	0.270	***	0.016
40-44	0.058	***	0.016	0.059	***	0.016	0.025	*	0.017	0.026	**	0.017	-0.083	***	0.016	-0.083	***	0.016
45-49	-0.486	***	0.016	-0.485	***	0.016	-0.519	***	0.017	-0.519	***	0.017	-0.607	***	0.016	-0.606	***	0.016
50-54	-0.771	***	0.016	-0.771	***	0.016	-0.784	***	0.017	-0.784	***	0.017	-0.858	***	0.016	-0.858	***	0.016
Age difference between spouses																		
Wife older																		
Husband 0-2 older	-0.025	***	0.003	-0.025	***	0.003	-0.027	***	0.003	-0.027	***	0.003	-0.040	***	0.003	-0.04	***	0.003
Husband 3-6 older	-0.041	***	0.016	-0.041	***	0.003	-0.054	***	0.003	-0.054	***	0.003	-0.058	***	0.003	-0.058	***	0.003
Husbans>6 older	-0.105	***	0.003	-0.105	***	0.003	-0.127	***	0.003	-0.127	***	0.003	-0.121	***	0.003	-0.121	***	0.003

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	1880				1890				1900			
	Model 2		**Model 3**		**Model 2**		**Model 3**		**Model 2**		**Model 3**	
	β	**Std. Error**	**β**	**Std. Error**	**β**	**Std. Error**	**β**	**Std. Error**	**β**	**Std. Error**	**β**	**Std. Error**
Individual level variables												
Children>4 years in the household												
No												
Yes	0.255 ***	0.003	0.255 ***	0.003	0.272 ***	0.003	0.272 ***	0.003	0.254 ***	0.003	0.254 ***	0.003
Women employed												
No												
Yes	-0.193 ***	0.016	-0.193 ***	0.016	-0.182 ***	0.014	-0.181 ***	0.014	-0.154 ***	0.013	-0.154 ***	0.013
Migrant status of the couple												
Both migrants												
Wife mig & husband non-mig.	-0.032 ***	0.005	-0.033 ***	0.005	-0.018 ***	0.005	-0.019 ***	0.005	0.011 ***	0.004	0.01 ***	0.004
Wife non-mig & husband mig.	-0.017 ***	0.005	-0.018 ***	0.005	-0.006 *	0.004	-0.007 **	0.004	0.010 ***	0.004	0.009 ***	0.003
Both non-migrants	-0.051 ***	0.004	-0.053 ***	0.005	-0.041 ***	0.004	-0.043 ***	0.004	-0.002	0.003	-0.005 **	0.003
Parish- level variables												
Industrial employment												
Low												
Medium			-0.016 ***	0.005			-0.007 *	0.005			-0.007 *	0.005
High			-0.022 ***	0.006			-0.025 ***	0.006			-0.029 ***	0.006
Teachers/100 children 7-14												
Low												
Medium			0.007 **	0.004			-0.006 *	0.004			-0.001	0.004
High			0.002	0.005			-0.016 ***	0.006			-0.030 ***	0.006
Female labor force participation												
Low												
Medium			0.000	0.005			-0.004	0.005			-0.008 *	0.005
High			-0.014 ***	0.006			-0.018 ***	0.006			-0.030 ***	0.006
Prop.migrants from early decline counties												
Low												
Medium			0.006	0.005			0.001	0.005			-0.028 ***	0.005
High			-0.031 ***	0.007			-0.027 ***	0.008			-0.064 ***	0.007

	1880				1890				1900			
	Model 2		**Model 3**		**Model 2**		**Model 3**		**Model 2**		**Model 3**	
	β	**Std. Error**	**β**	**Std. Error**	**β**	**Std. Error**	**β**	**Std. Error**	**β**	**Std. Error**	**β**	**Std. Error**
County level variables												
Industrial employment												
Low												
Medium			-0.003	0.036			-0.026	0.027			0.007	0.033
High			-0.045	0.041			-0.025	0.029			0.036	0.039
Teachers/100 children 7-14												
Low												
Medium			-0.028	0.038			-0.058 ***	0.024			-0.045 *	0.032
High			-0.084 ***	0.035			-0.110 ***	0.03			-0.082 ***	0.038
Female labor force participation												
Low												
Medium			-0.004	0.030			0.032 *	0.024			-0.023	0.026
High			-0.051 *	0.034			0.012	0.03			-0.058 *	0.034
Prop.migrants from early decline counties												
Low												
Medium			-0.035	0.033			-0.025	0.025			-0.046 **	0.028
High			-0.152 ***	0.044			-0.107 ***	0.028			-0.133 ***	0.034

Note: p<.01***; p <.05 **; p <.10 *