# Female Teachers: The Roots of Women's Emancipation*

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**Abstract**

This paper studies the emancipation of women, measured by their entry into the labor force and political participation. We document the feminization of the teaching profession and the overrepresentation of teachers among Sweden's female political and suffrage elite during the nineteenth and twentieth centuries. Using a natural experiment and drawing on a newly digitized dataset of nineteenth-century elementary school teachers, we establish that state intervention in providing female teacher education brought a social transition to a more work-centered life among women. We show how these developments explain the spread of the women's suffrage movement from 1902 to 1919, and the mobilization of women in the first countrywide election with equal voting rights for men and women in 1919.

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# 1 Introduction

Two centuries ago, women had a low social standing. Since then, their social status has improved. What explains this shift? In Sweden, the decades around the turn of the 20th century have been identified by many as a crucial period regarding women's entry into the public sphere and their increasing participation in work outside of the household. This period also marked the formation of modern Sweden: the establishment of a primary education system in 1842, the dissolution of the Estates of Sweden in 1866, the agrarian and industrial revolutions between 1850 and 1870, mass emigration to the United States in the late 19th century, and universal and equal suffrage for men and women in 1919/1921.

In this paper, we show that state intervention in providing female teacher education led to a social transition among women toward a more work-centered life outside the household. We focus on women born between 1840 and 1880, who grew up during industrialization and the edge of the first wave of feminism, which brought significant changes to Swedish society in the early 20th century. These women experienced gradual increases in their legal rights to education, economic opportunities, and social freedom. We document that earlier cohorts entered household service less than later cohorts, who increasingly joined new employment areas, including lower professions and white-collar clerical and administrative positions. This trend reflects both the institutional-legal emancipation of women and their achievements in pursuing careers outside the household. We find that the rise of female teachers between 1880 and 1910 in Sweden contributed to this shift. Specifically, we show that female teachers, compared to male teachers, positively impacted girls' future entry into work sectors outside the household and their entry into professional and clerical occupations.

Compared to existing literature on the historical impact of female teachers, our analysis offers several advantages. First, we have reconstructed the administrative boundaries of over 2,000 elementary school districts from 1859 to 1889, allowing us to match individuals in the full-count decadal censuses of Sweden from 1880 to 1910 to their school districts of birth. Second, by measuring the start year of all elementary school teachers in Sweden in 1876, 1882, and 1889, we can accurately determine when each district hired its first female teacher. This enables us to conduct an event study design at the school district level to estimate the long-term impact of hiring the first female teacher on girls in each district, which we interpret as the impact of the feminization of the teaching profession. Our database is, to the best of our knowledge, the first to provide

individual-level data on teachers during the early decades of a national primary education system. Finally, we measure detailed contemporaneous occupational choices that allow us to explain the trend from 1880 to 1910 in the declining share of women working in households, whether as servants or agricultural workers, and the increasing share working outside the household, whether in the public sphere as teachers, in factories as production workers, or in offices as clerks.

**Related Literature** Our paper contributes to the literature on female education, social change, women's emancipation, and the broader emancipation of historically marginalized groups (Fernández, 2013; Nekoei and Sinn, 2021; Goldin, 2021; Althoff and Reichardt, 2024; Bühler, Vollmer and Wimmer, 2024). It broadly addresses the determinants of human capital (Goldin, 2024) and more specifically examines the consequences of the feminization of the teaching profession and the impact of female teachers on female students in the early development of national primary education (Cappelli and Quiroga Valle, 2021; Card et al., 2022). By digitizing and harmonizing newly collected archival data, we also add to historical works on female teachers in 19th-century Sweden (Florin, 1987).

**Organization of the Paper** The remainder of this article is organized as follows: Section 2 provides historical context. Section 3 describes our datasets. Section 4 explains our empirical strategies. Section 5 presents and discusses the empirical results. Section 6 concludes.

## 2 Historical Context

This section provides historical context on nineteenth- and early twentieth-century Sweden, focusing on the rise of primary education, the feminization of teaching, and shifts in the occupational structure of women during the 19th century.

### 2.1 The Rise of Primary Education

In the eighteenth century, primary education primarily involved home instruction by male household heads and examinations by clergies. They taught and examined children in reading, counting, and writing, as per the Church Law of 1686. The primary goal was to teach the ability to read and understand religious texts. This ensured that approximately 85% of the population had some level of reading ability by the early 19th century (Nilsson, 1999). In contrast, as few as 10% of children received any form of formal schooling outside of their homes in the 1820s, with the majority of

schools concentrated in Southern Sweden within the Diocese of Lund before 1842 (Ljungberg and Nilsson, 2009; Klose, 2011).

The Swedish educational system fundamentally changed with the School Act of 1842. The act made it compulsory for each of Sweden's 2,308 parishes to participate in a school district that operated at least one school and that teachers' seminaries (i.e., teacher training colleges) should be instituted. These schools would offer education beyond basic reading, counting, and writing, covering subjects such as history, geography, biology, and more. The successful implementation of the reform is shown in Table A1. From 1839 to 1868, the number of schools increased from 1,516 to 6,919, and the number of teachers rose from 1,537 to 7,045.

The responsibility for financing primary schools fell on the local parishes with only limited state subsidies allocated.[1] Consequently, this arrangement resulted in large variations in both the accessibility and quality of schools (Andersson and Berger, 2019).

The act introduced a national minimum wage for teachers and provided national funding for teachers' seminaries.[2] It mandated the establishment of one seminary in each of the twelve diocesan capitals, and for the Diocese of Uppsala, it required two seminaries: one in the City of Uppsala and another in the City of Stockholm. These seminaries were overseen by the bishop and offered training in both spiritual and secular subjects, including teaching methods. Initially, the seminary program lasted 1 to 3 semesters, expanding to six semesters in 1862 and then to eight in 1878.

### 2.2 The Feminization of the Teaching Profession

In the first two decades following the 1842 School Act, women were formally excluded from teaching positions unless granted state dispensation.[3] However, there was a severe shortage of teachers nationwide, particularly in rural areas. Influenced by educational reformer Torsten Rudenschöld, the first two to three years of elementary schooling were exempted from the requirement for a certified teacher. These minor and junior schools swiftly began to be staffed by women starting in the late 1850s (Florin, 1987). A royal decree issued in 1859 further opened up teaching roles for women for the remaining five to six years of elementary schooling. Consequently, the government had to estab-

[1] Initially, only poor districts received subsidies. However, in 1845, a per capita state subsidy was introduced, and in 1871, the subsidy system underwent major changes (Westberg, 2017).

[2] In 1906, a national differentiation in minimum wages was implemented, with higher wages designated for male teachers. However, in most cities, wages exceeded the minimum even before 1906, and the wages above the minimum were usually higher for men.

[3] Only a dozen women received such dispensation before 1860 (Spetze, 1992).

lish teachers' seminaries for women. Though the idea of co-education was discussed, most dioceses, except Stockholm and Härnösand, opposed it on morality grounds (Folkundervisningskommittén, 1912).

In the fall of 1860, the government decided to convert the seminaries in Skara, Strängnäs, and Kalmar into female-only institutions. These cities were selected partly to ensure regional balance. However, the ongoing debate about reducing the number of seminaries persisted, leading to a parliamentary agreement in 1864. Initially, the proposal suggested maintaining one male seminary in each of the five major regions (east, west, south, north, and central), with only one female seminary for all of Sweden. To appease Parliament, the government retained an additional male seminary in the south (Växjö) and transformed the seminary in Stockholm into a female-only institution by 1865. However, the two female seminaries in Kalmar and Strängnäs, along with those in Visby and Västerås, were short-lived, closing down in 1866 and 1867. The seminary in Karlstad faced closure around the same time but was rescued by a parliamentary initiative. In the 1870s, three new seminaries, all female, were established: in Falun and Kalmar in 1875, and in Umeå in 1879 (Folkundervisningskommittén, 1912).

The overall impact of these reforms is depicted in Figure A2. In 1862, there were 113 female teachers and 3,155 male teachers, constituting 3.6% of the teaching workforce. This percentage surged to 24.5% in 1892 and 35.6% in 1910. Figure A3 shows the same trend among graduates from teachers' seminaries.[4]

### 2.3 The Occupational Structure of Women

In the 1840s, 90% of the 3.3 million inhabitants lived in rural areas. Married women usually worked with their husbands. Typically, only wealthy farming families allowed women to concentrate solely on homemaking. A woman inherited a farm only if her husband died, managing it until remarriage or estate settlement. In retail, wives often worked at the counter. Widows took over legal and

[4]It is worth mentioning that female teachers could be hired in private girls' schools. Figure A5 shows the growth of girls' schools in Sweden. Most were established after the 1860s. According to Barrio de López (2002), many of these schools were founded by top graduates from regular female teachers' seminaries or graduates from the newly established Royal Advanced Female Teachers' Seminary, which prepared women for teaching positions at private girls' schools. Figure A4 shows the number of graduates from this institution. State support for girls' schools began in 1873, coinciding with a significant increase in their establishment. Before 1859, most female teachers were unmarried governesses, catering to a small, affluent segment of Swedish society, though their numbers were relatively small, as seen in Figure A6.

financial control of craftsmanship businesses. Unmarried women and young farm girls had limited professional opportunities (Hinnemo, 2016).

Between 1846 and 1864, pivotal regulations in factory and craft industries allowed women to enter entrepreneurship on par with men. Teaching rights expanded, starting with minor schools in 1853 and extending to all elementary schools by 1859. By the 1880s, women formed the majority in restaurants and cafes. Significant shifts occurred in the industrial and craft sectors, with women becoming the majority in textile work by 1910. Professionalization surged during this time, with women gaining access to teaching roles in 1853 and lower-level government jobs in 1859. From 1863, women could work as telephone operators and office clerks at the Swedish Post and Telecom Authority. Women could pursue academic degrees in all fields except law and theology by 1873. Moreover, the number of female professional midwives experienced significant growth from the mid-19th century and the first nurse college was open in 1867.

These shifts can be attributed to institutional and legal reforms enacted between the 1840s and 1860s. Figure A1 illustrates the evolution of pro-women reforms during this period. Between 1842 and 1864, a total of 17 reforms were passed, with 9 on women's education, while the remainder focused on deregulating barriers to entry into entrepreneurship and professional occupations. These events mark a clear departure from the preceding era, which saw nearly two centuries without significant pro-women reforms.

Figure A7 and A8 show the change in the distributions of major occupational groups for women from 1880 to 1910, two decades post the aforementioned reforms. In 1880, nearly 75% of working women were in the service sector, primarily as household servants. Over 90% of them worked as maids or houseworkers in others' homes. Production and agriculture also employed many women, though the agricultural count was likely much higher due to married women not being recorded as agricultural workers. By 1910, a notable shift from 1880 is evident: fewer women were in service roles, while more occupied professional, sales, administrative, managerial, and clerical positions.

These trends signal a growing number of women engaging in careers beyond the household, including factory production, administrative roles in workplaces or offices, and public positions like midwifery and teaching. In short, it represents a significant shift towards women working in the public sphere.[5]

[5]This section is primarily based on Carlsson (1966).

# 3 Data

We construct a new dataset on individual exposure to the elementary school system in Sweden between 1849 and 1889. We combine two main data sources: (i) full-count registers of elementary school teachers in 1876, 1882, and 1889; and (ii) full-count decennial censuses of Sweden between 1880 and 1910.[6]

**Teachers** Our main treatment of interest is an annual indicator of female teachers in school districts. The sources for these treatments are printed full-count registers of teachers published in 1876, 1882, and 1889 (Beskow and Schönmeyr, 1876; Beskow, 1882; Borgh, 1889). Figure A10, A11, and A12 shows extracts from these registers.[7] For each register and school district, we digitize information on each teacher's first name, year of birth, year of exam, and year of employment in the school district. For the 1889 register, we digitize information on each teacher's place of birth and graduation.[8] We infer the gender of a teacher from the first name and auxiliary variables and statistics from the corresponding source.[9]

Table 1 presents summary statistics on school districts and teachers. From 1876 to 1889, the number of teachers rose from 3,569 to 5,420, with the share of female teachers increasing from 8% to 21%. The percentage of school districts with a female teacher grew from 5.7% to 16.6%. Female teachers were about 8–10 years younger than male teachers. Their experience, measured by years

[6] For brevity, we henceforth refer to elementary schools as schools and elementary school teachers as teachers.

[7] The 1876 and 1882 registers were compiled by office secretaries at the Department of Ecclesiastics and the Pension Institution for Elementary School Teachers. The 1889 register was assembled by a teacher in Lekeryd Parish, Sweden who between 1887 and 1889 collected data by letters sent to school districts, parish clergies, municipal councilors, and school inspectors. The primary source material underlying these registers is available as handwritten manuscripts at the National Archives of Sweden. Using this material, it is possible to construct a panel dataset of teachers by school district from 1861. Digitizing these would demand a significant effort though.

[8] The 1876 and 1882 registers do not contain information on teachers' places of birth and graduation.

[9] For the 1876 and 1882 registers, we infer the gender by the probability that a first name is feminine. The probability that a first name is feminine is based on the share of females with that name in the 1880 to 1910 censuses. For shares close to 0.5, we manually infer the teacher's gender. For the 1882 register, we also check our coding against a table in the register with information on the number of female teachers per county (Beskow, 1882, p. VI). For the 1889 register, we can usually infer a teacher's gender from their exam year and place. Since 1860, teachers of different genders could not be examined at the same seminary. For a few difficult cases, such as those with abbreviated first names and no exam place, we use the first name, surname, year of birth, and location of the school district to find the individual in a parish register to determine their gender. The parish registers are searchable and available online at https://www.arkivdigital.net/.

since graduation, increased from 6 years in 1876 to 10 years in 1889, while male teachers' experience remained around 16 years. Female teachers' tenure in their current district rose from 3 years to 7 years, while male teachers' tenure stayed at about 12 years. Female teachers were concentrated in urban districts with population densities above 1000 inhabitants per square kilometers in 1880, while male teachers were more common in rural areas with a density between 100 and 200. In 1889, the average distance from a teacher's school district to their exam place was close to balanced at about 135 for female teachers and 112 for male teachers. Figures A13, A14, and A15 display the geographic distribution of female teachers, indicating a concentration in cities and parishes near female teachers' seminaries.

**Demography and Occupation** The censuses contain individual-level data on year of birth, parish of birth, parish of residence, civil status, occupation, and family relationships between members of households. Occupational titles are coded using the Historical International Standard of Classification of Occupations (HISCO), which allocates titles to 7 major occupational groups divided into five-digit codes representing 79 minor occupational groups subdivided into 1,255 occupational unit groups (van Leeuwen and Miles, 2002). This system allows us to aggregate occupations recorded in the censuses. For each occupational unit group, there is a relation code that contains temporal information and information on household relations.[10] We use the HISCO occupation and relation code to create an indicator of occupational choice. An individual is considered to have made an occupational choice if they are over 15 years old and either studying for an occupation, is about to assume an occupation, have a reported occupation, or had an occupation, excluding titles related to the household (e.g., "worker's wife", "housewife").

**School Age** The starting age for primary school was regulated by the school districts until the School Act of 1882 mandated that children begin primary school at age 7 and continue until age 14. Previously, the School Act of 1842 prescribed that schooling should start no later than age 9. However, official statistics from 1868 assume most children attended primary school from age 7 to 14 (Carlson, 1870).[11] Children attend junior school for the first two years and then transition to elementary school for the remaining years. We therefore set the age range for treatment to 9–14.[12]

[10] Our harmonization of Swedish occupational titles into the HISCO system is from the Swedish Population Databases for Research (SwedPop, 2024).

[11] Department of Ecclesiastics (1887) estimated that 8.8% of children in 1882 attending primary school were outside the age range 7–14.

[12] Figure A16 displays the 1882 primary school enrolment ratios by county.

**School District Linkage** Our empirical strategy relies on linking individuals to the school district in which they resided during their school age. The censuses do not record any information on school districts.[13] However, since school districts were managed by congregations accountable to the tax-paying inhabitants of their respective parishes and responsible for maintaining school attendance records (Westberg, 2017), we assume children attended school in their school district of residence. Therefore, we use an individual's parish of birth to infer the school district in which they resided during school age. In 1880 and 1890, for the construction of school districts detailed below, about 80% of school-aged children reside in their school district of birth.

The second problem is that there are no comprehensive maps or shapefiles of school districts for nineteenth-century Sweden. However, school districts often coincide with other contemporary administrative borders. Thus starting from a shapefiles of administrative borders of Sweden covering the nineteenth and twentieth centuries (National Archives of Sweden, 2008) together with digitized historical maps of Sweden from The Swedish Land Survey, we construct shapefiles of school districts for each registry year $t$.[14]

We then create a set of *stable school districts* that meet three criteria. First, their polygons cover all of Sweden, are disjoint, and have boundaries that remain unchanged over time. Second, each school district in 1876, 1882, and 1889 corresponds to exactly one stable school district.[15] Third, individuals born in the same place between 1840 and 1880 (during which boundaries might change) belong to the same, single stable school district.[16] The full procedure is to be detailed in

[13] The teachers' diaries containing grade catalogs are the primary extant sources for matching individuals to school districts. However, in our study period, only a small portion of these are available in Swedish archives. Additionally, digitizing hundreds of handwritten catalogs would demand a significant effort.

[14] We use historical maps from The Swedish Land Survey and Stockholm University Library's collections. Maps from The Swedish Land Survey are available online at https://historiskakartor.lantmateriet.se. Sources for specific school districts are available on request.

[15] Thus, if different school districts intersect, they belong to the same stable school district. For example, consider the City of Gothenburg. In 1876, the city itself was a single school district. However, in 1882 and 1889, Gothenburg was subdivided into separate school districts based on its parishes. Therefore, the set of stable school districts will not include parishes within the City of Gothenburg as individual school districts. Instead, it will treat the entire City of Gothenburg as a single school district.

[16] Consider Southern Fågelås Parish and Northern Fågelås Parish. In 1876, 1882, and 1889, they were separate school districts. However, the censuses did not separately register inhabitants of these parishes until 1910. In the 1880—1900 censuses, individuals born in Southern Fågelås Parish or Northern Fågelås Parish were instead classified as born in Fågelås Parish. Therefore, the set of stable school districts will neither include Southern Fågelås nor Northern Fågelås as individual school districts, but will instead treat their union, Fågelås, as a single, stable school

appendix 6.

**Women's Suffrage Leaders and Female City Councilors** From the annual reports of the National Association for Women's Suffrage (NAWS), we acquire the first name, surname, gender, civil status, and occupation of the leaders of each local chapter of the NAWS between 1902 and 1920.[17] From articles published in the Swedish women's magazines *Dagny* and *Rösträtt för kvinnor* between 1910 and 1919, and city council protocols held by the corresponding municipal archives of today, we collect the first name, surname, civil status, and occupation of every woman elected to a city council in Sweden between 1910 and 1919, before universal and equal suffrage in local elections was enacted in March 1919.[18] The years and parishes of birth for these individuals are then identified in the parish registers.[19]

**Women's Political Participation** We gather extensive data on women's political involvement in the early nineteenth century. First, we digitize membership figures from 1902 to 1919. Second, we digitize the number of signatories per location for the nationwide women's suffrage petition in 1913–1914, totaling approximately 351,000 signatures.[20] Third, we digitize data from the municipal elections of 1919, the first countrywide election with universal and equal suffrage. This data includes vote counts by gender and municipality, along with distinctions on who cast the votes (e.g., spouse or another individual).

**Income Scores and Educational Attainment** Data on income and educational attainment is not recorded in the 1880–1910 censuses. We are awaiting 1930 census data from the National Archives of Sweden in which such information is available. Currently, about 52% of the 1930 census has been digitized. Using this data, we intend to compute income scores by county and occupation that we attach to occupations in 1910. We also intend to examine educational attainment as an

district.

[17] The annual reports for 1904–1921 are available online at https://gupea.ub.gu.se/handle/2077/51939. The annual reports for 1902–1903 can be found in the archive of the NAWS at the National Archives of Sweden, which is available online at https://sok.riksarkivet.se/arkiv/LvFYFecRrH6d0G02H087k3.

[18] These magazines are available online at https://www2.ub.gu.se/kvinn/digtid/.

[19] Our genealogical work identifying these women is documented online on Wikidata.org. See the entries at https://w.wiki/A7Mz for local leaders of the NAWS and https://w.wiki/A7N8 for female city councilors.

[20] This was done as part of a larger citizen science project in which we digitize the first name, surname, civil status, occupation, and residential address of each signatory. The project is run together with the National Archives of Sweden and available online at https://fromthepage.com/riksarkivet/i-demokratins-namn.

outcome variable and investigate whether the impact of female teachers on mothers is transmitted to their daughters who are adults in 1930.

## 4 Empirical Strategy

We are interested in female teachers' impact on women's occupational choice. We begin by estimating equations of the following form:

$$\text{Occupation}_{isct} = \alpha_{p(s)ct} + \beta \times \text{FemaleTeacher}_{sr(c)} + \epsilon_{isct}. \tag{1}$$

In our baseline specification, $\text{Occupation}_{isct}$ is a dummy variable equal to 1 if individual $i$ born in school district $s$ year $c$ has an occupational title in census year $t$ as defined in Section 3. We then proceed to decompose this outcome into broad occupational categories (e.g., sectors of work or skill levels). Here $\text{FemaleTeacher}_{sr(c)}$ is a dummy variable equal to 1 if individuals born in school district $s$ year $c$ had a female teacher in registry year $r(c) \in \{1876, 1882, 1889\}$. Hence, the specification restricts the sample to individuals of school age in 1876, 1882, or 1889.[21] The fixed effect, $\alpha_{p(s)ct}$, controls for cohort fixed effects, the aging of cohorts across censuses, and $p(s)$, which indicates if $s$ is urban (population density above 1000 per square kilometer in the 1880 census) or the percentile score of $s$ in the 1880 school district population density distribution. The coefficient of interest is $\beta$, the effect of having a female teacher on occupational choice.[22]

Estimating the fixed effects specification (1) using OLS is descriptive but might not allow for a causal interpretation of the estimate of $\beta$. Graduates from female teachers' seminaries may choose school districts with a higher proportion of professional women, and school districts in municipalities that more actively try to improve the career prospects of girls in schools may be more likely to offer teaching positions to females.

To credibly identify the causal effect of female teachers on occupational choice, we instead rely on a difference-in-differences approach. This approach looks at the effect within school districts of the cohorts that attend school after the employment of the first female teacher. More specifically,

[21] The expected age range for schooling is 9–14. Thus, $\{c : r(c) = r\} = \{r - s : 9 \leq s \leq 14\}$. For example, $\{c : r(c) = 1876\} = \{1862, \ldots, 1867\}$ are the cohorts we expect to attend to school in 1876.

[22] Equation (1) is saturated in fixed effects to ensure that the OLS estimate of $\beta$, which represents a weighted average of covariate-specific treatment effects, has convex weights.

we estimate the following stacked event study design specification:[23]

$$\text{Occupation}_{sct} = \alpha_{st} + \gamma_{ct} + \sum_{a \neq 16} \beta_{aE_s} \times \mathbf{1}[E_s - c = a] + \epsilon_{sct}, \tag{2}$$

where $\text{Occupation}_{sct}$ is the share of women in birth cohort $c$ in census $t$ with an occupation in school district $s$, $E_s$ is the year school district $s$ hires its first female teacher, and $E_s - c$ is the age at treatment. The treatment timing, $E_s$, is measured as the earliest start year of female teachers in school district $s$ based on the 1876, 1882, and 1889 registries.[24] We interpret the timing of the treatment as marking the start of the feminization of the teaching profession in the school district and a positive shift in attitude towards hiring professional women.[25] In 1876, 123 school districts had female teachers, with 108 and 104 of these maintaining them by 1882 and 1889, respectively. In 1882, an additional 144 districts had female teachers, with 113 of these maintaining them by 1889.[26]

The specification accounts for heterogeneity in birth and adoption cohorts, as indicated by the subscript of the treatment effects, $\beta_{aE_s}$. The effects are estimated using the Callaway and Sant'Anna (2021) estimator and are aggregated across adoption cohorts to estimate the treatment effect in age at treatment. Treatment starts for cohorts that are still in school age at or after the hiring of the first female teacher, i.e., for $a < 16$; the omitted category, $a = 16$, is thus the last cohort to not experience the feminization of teaching. Since school years span two years, we group individuals of consecutive odd and even ages (e.g., ages 14 and 15) together to increase the precision of our estimates.

The identifying assumption for the causal interpretation of $\beta_{aE_s}$ is parallel trends, i.e., that treated and untreated school districts would have followed the same occupation trend without treatment. One argument supporting this assumption is the seemingly random timing of the treatment: In 1876, among school districts with no female teachers, 7.4% of those with at least one male teacher reaching pension age by 1882 hired a female teacher, compared to 3.8% in districts without such a male teacher.[27] We assess the plausibility of the parallel trends assumption by

[23] See Cengiz et al. (2019) for an example of a stacked event study approach.

[24] The distribution of treatment timing is given in Figure A17.

[25] A female teacher would be hired only after a parish or church meeting decided to post a job ad in *Post and Domestic Times*, Sweden's government newspaper.

[26] In these districts, female teachers consistently make up about 50% of the total number of teachers, as Figure A18 illustrates. In the majority or about 30% of these districts, there is one female teacher and one male teacher.

[27] A royal decree in 1876 set the pension age for teachers at a minimum of 55 years old with at least 30 years of service (Beskow, 1882).

testing if $\beta_{aE_s} = 0$ for all $a > 16$.

# 5 Results

## 5.1 Fixed Effects Results

We begin by reporting the results from the fixed effects regressions specified in (1). These regressions estimate the impact of female teachers on individuals born in school districts with at least one female teacher during their schooling, compared to those with only male teachers.

The fixed effects results are presented in Table A2. Columns (1) and (2) show a significant difference in the likelihood of having an occupation for women born in districts with at least one female teacher compared to those with only male teachers. Having a female teacher increases the likelihood from around 24 to 28 percent, i.e., by around 4 percentage points or about 17 percent of the control mean.

In columns (3) and (4), we control for the differential impact of growing up in large cities. In column (3), where we control for being born in a large city, the estimated impact diminishes to 1.5 percentage points when accounting for whether the school district of birth is urban. It further decreases to 1 percentage point in column (4), where we control for the population density percentiles of school districts in the 1880 census. This speaks to the result in Berger, Karadja and Prawitz (2024) who find that women in large cities in Sweden were substantially more likely to be in the labor force.

Using this policy variable, we are currently exploring an instrumental variables design more tied to the fixed effects specification (1):

$$\text{Occupation}_{isct} = \alpha_{p(s)ct} + \beta \times \text{FemaleTeacher}_{sr(c)} + \gamma \times x_{sr(c)} + \epsilon_{isct} \tag{3}$$

$$\text{FemaleTeacher}_{sr(c)} = \alpha_{p(s)ct} + \delta_1 \times z_{sr(c)} \times x_{sr(c)} + \delta_2 \times x_{sr(c)} + \epsilon_{isct} \tag{4}$$

In this specification, we intend to first restrict the sample to all school districts $s$ whose distance from its centroid to a teachers' seminary is $r$, which is set to a value that maximizes the first-stage $F$-statistic. Second, we create the control variable $x_{sr(c)}$ equal to 1 if $s$ is closest to a female teachers' seminary and 0 if closest to a male teachers' seminary at the time at which cohort $c$ attends school. Third, we create the instrumental variable $z_{sr(c)}$ equal to 1 if in the registry previous to $r(c)$, there was a male teacher who in registry year $r(c)$ would reach the age of pension (alternatively, the number of such male teachers). This forces us to restrict the analysis to $r(c) \in \{1882, 1889\}$. The specification posits that, given proximity to a female teachers' seminary, a higher proportion of male teachers nearing retirement in the previous registry predicts the hiring of female teachers and is independent of other factors that determine if a woman bears an occupational title.

Columns (5) to (7) restrict the sample to different age groups. The impact of female teachers is insignificant for women aged 20–29, stable for women aged 30—39, and doubles for women aged 40–49. However, for the 40—49 age group, the sample only includes women in the 1910 census, as those who attended school between 1882 and 1889 had not yet turned 40. In column (8), we instead restrict the sample to the 1910 census. Here, the impact remains significant but is only 60 percent of the effect observed for those aged 40–49, suggesting that the large effect in column (7) is not specific to the 1910 census. This suggests that the difference is most pronounced for women who have already made significant life choices regarding career and family.

### 5.2 Event Study Results

In this section, we present the results for the event study specification (2). We plot the estimated coefficients as well as their 95 percent confidence intervals by age of treatment. The pre-trend coefficients help us evaluate the credibility of the parallel trends assumption. Treatment effects are compared to the omitted category, which includes ages 16 to 17. Treatment effects for ages 10 to 15 are partial, as these individuals have already begun elementary school when the first female teacher is hired. Ages below 9 are considered fully treated, as by the time they start school, the feminization of teaching has already begun.

Figure 1 presents the main result. The conventional pre-trend test is not rejected, and contrary to our fixed effects results, we observe no impact on having an occupational title. This result appears to be obscured by counteracting effects. Figure 2 illustrates the effect for individuals with an occupational title but who work and reside as servants in households. The long-term effect is both significant and notably negative. In contrast, Figure 3 examines the effect on having an occupation outside the household, revealing a significant, substantive, and positive long-term effect. Hence, women who had a female teacher appear more inclined to work, but outside of other people's households.

### 5.3 Breakdown by Sectors of Work

The positive impact of female teachers on occupational choice can be attributed to two key factors. Firstly, female teachers served as professional role models for girls, inspiring them to pursue various careers. Secondly, compared to male teachers, female teachers were perceived as more effective educators. This interpretation finds support in qualitative studies on the role of elementary school teachers (Dahllöf, 1987; Johannesson, 1989).

To empirically investigate this hypothesis, we use the HISCO scheme to categorize our primary outcome into seven distinct sectors of work: professional, administrative and managerial, clerical, sales, service, agricultural, and production. The results are given in Table 3. (Examples of most common occupation in each group is given in Table 4.

The effect is significant, positive, and substantial for entry into professional, clerical, and agricultural work. The effect on professional work may be attributed to a role model effect: girls taught by a female teacher see, perhaps for the first time, a woman working as a professional. The effect on clerical work—a type of lower white-collar work where the basic skills taught in elementary school are directly valuable—may be attributed to the notion that female teachers are better at teaching the curriculum to girls than male teachers. However, the effect on agricultural work is challenging to reconcile with the fact that elementary schools did not specifically focus on teaching agriculture. This result may be due to the under-reporting of agricultural work among married women. Therefore, we also examine the effect on an adjusted measure of agricultural work, where married women living in agricultural households are classified as agricultural workers if they have no occupational title. For this measure, the effect is null. The effect is significant and strongly negative for entry into the service sector, consistent with our main event study results.

In addition, our estimated pre-trend coefficients in the agricultural occupation regression indicate differential trends between treated and non-treated school districts. Therefore, the estimated coefficient should not be interpreted causally.[28]

## 6 Concluding Remarks

This paper provides new evidence on the role of female teachers in accounting for women's economic advances around the turn of the 20th century in Sweden. Using census data and newly digitized full-count registers of elementary school teachers during the 19th century, we track the feminization of the teaching profession at the local level. Employing fixed effects and event study designs, we find a significant positive impact on entry into the labor force in the fixed effects design, but this effect vanishes in the event study design. Further analysis reveals that this null effect is due to a negative impact on women working within households and a positive impact on those working outside. A breakdown of the positive impact reveals that female teachers primarily encouraged women to enter professional and clerical occupations.

[28] We plan to further investigate the presence of pre-trends in different sectors of work.

Thus, women who had female teachers were more likely to transition from domestic work to the formal labor market. However, despite these advancements, women did not attain equal suffrage rights with men until 1919/1921. In the early 20th century, a national movement for women's suffrage emerged. Figure 4 shows that areas of Sweden with a higher proportion of women exposed to female teachers also witnessed a higher likelihood of being connected to the women's suffrage movement. Figure 5 demonstrates that in these areas, women were also more inclined to support the notion of equal political rights for both genders. Figure A19 further suggests that many of these women, who entered the professional workforce as teachers (the most common female occupation in the professional sector), emerged as leaders among the most politically active. A similar pattern can be seen in the political sphere. The 1919 municipal elections marked the first nationwide election with universal and equal suffrage. Figure 6 and 7 show that municipalities with a higher proportion of women exposed to female teachers did not exhibit a significant difference in the turnout gap between men and women. However, women in these areas were more likely to vote in person, indicating a higher level of direct participation in the electoral process. We intend to conduct further investigation into all of these findings.

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# Tables

Table 1: Summary Statistics: Schools and Teachers

| | Registry year | | |
|---|---|---|---|
| | 1876 | 1882 | 1889 |
| **Panel I: School districts** | | | |
| # school districts (stable) | 2223 | 2223 | 2223 |
| # school districts (in registry) | 2276 | 2351 | 2400 |
| # schools | 4519 | 5020 | 5451 |
| # teachers | 3569 | 4220 | 5420 |
| % female teachers | 8.01 | 13.27 | 20.79 |
| % vacant positions | 4.93 | 5.30 | 4.54 |
| # teachers per school district | 1.69 | 2.00 | 2.55 |
| # female teachers per school district | 0.13 | 0.26 | 0.51 |
| % school districts with female teachers | 5.53 | 11.34 | 17.05 |
| % school districts with only female teachers | 0.54 | 1.30 | 1.12 |
| **Panel II: Female teachers** | | | |
| Age | 31.70 | 32.61 | 33.89 |
| | (7.20) | (7.25) | (8.11) |
| Years since graduation | 6.13 | 7.88 | 10.00 |
| | (3.90) | (4.72) | (5.88) |
| Years in current position | 3.33 | 5.01 | 7.51 |
| | (3.34) | (3.96) | (5.54) |
| School district population density (km2) | 1539.15 | 1333.53 | 1688.67 |
| | (1788.59) | (1739.31) | (1883.52) |
| Distance from birthplace to seminary of graduation (km) | | | 219.67 |
| | | | (145.86) |
| Distance from seminary of graduation to school district (km) | | | 133.66 |
| | | | (138.59) |
| Distance from birthplace to school district (km) | | | 254.12 |
| | | | (165.17) |
| **Panel III: Male teachers** | | | |
| Age | 40.20 | 38.75 | 39.86 |
| | (10.61) | (10.10) | (10.67) |
| Years since graduation | 16.87 | 15.38 | 16.41 |
| | (9.94) | (10.25) | (10.61) |
| Years in current position | 12.56 | 10.69 | 12.04 |
| | (10.17) | (9.30) | (9.21) |
| School district population density (km2) | 123.06 | 130.29 | 169.92 |
| | (534.60) | (528.25) | (632.94) |
| Distance from birthplace to seminary of graduation (km) | | | 108.53 |
| | | | (112.96) |
| Distance from seminary of graduation to school district (km) | | | 111.69 |
| | | | (101.98) |
| Distance from birthplace to school district (km) | | | 178.57 |
| | | | (145.57) |

*Notes:* Summary statistics for 2,223 stable school districts, based on data from the registers of 1876, 1882, and 1889 described in Section 3, with the number of schools sourced from Statistics Sweden (BiSOS P). The percentage of female teachers is calculated excluding vacant positions. Panels II and III summarize individual teacher characteristics, with standard deviations in parentheses. Population density is calculated from the 1880 census population data.

## Table 2: Fixed Effects Results

| Dependent variable: | Has occupation (= 1) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Age: 20–29 | Age: 30–39 | Age: 40–49 | Census: 1910 |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Female teacher (= 1) | 0.045*** | 0.036*** | 0.015*** | 0.010** | 0.006 | 0.019*** | 0.041*** | 0.024*** |
| | (0.012) | (0.013) | (0.004) | (0.004) | (0.006) | (0.005) | (0.008) | (0.005) |
| Census FEs | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cohort FEs | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Urban FEs | No | No | Yes | No | Yes | Yes | Yes | Yes |
| Pct. pop. density in 1880 FEs | No | No | No | Yes | No | No | No | No |
| Censuses | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 |
| Cohorts | 18 | 18 | 18 | 18 | 18 | 18 | 9 | 18 |
| School districts | 2223 | 2223 | 2223 | 2223 | 2223 | 2223 | 2219 | 2223 |
| Observations | 1655853 | 1655853 | 1655853 | 1655853 | 669749 | 600225 | 263472 | 578374 |
| Control mean | 0.236 | 0.236 | 0.236 | 0.236 | 0.298 | 0.181 | 0.181 | 0.189 |

*Notes:* OLS regressions. The sample consists of women in the 1890, 1900, and 1910 censuses who were eligible for schooling in 1876, 1882, and 1889. The outcome is measured by age 16. The urban fixed effects are indicator variables indicating if the school district is urban or not, where urban is defined as having a population density above 1000 per square kilometer in the 1880 census. The urban school districts are school districts in the cities of Eskilstuna, Gothenburg, Gränna, Kalmar, Lund, Malmö, Norrköping, Stockholm, and Uppsala. Fixed effects are always interacted. Standard errors, in parentheses, are clustered at the school district level. *, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively.

Table 3: Average treatment effects by major sectors of work

| Sector of work | Treatment effect | Std. Err. | Pre-trends p-value | Control mean |
|---|---|---|---|---|
| Professional | 0.0026*** | 0.0009 | 0.0433 | 0.0145 |
| Admin and Managerial | −0.0011 | 0.0008 | 0.0111 | 0.0119 |
| Clerical | 0.0014*** | 0.0004 | 0.2992 | 0.0025 |
| Sales | −0.0003 | 0.0007 | 0.0500 | 0.0072 |
| Service | −0.0088*** | 0.0033 | 0.4051 | 0.1382 |
| Agricultural | 0.0023*** | 0.0008 | 0.0006 | 0.0085 |
| Production | 0.0020 | 0.0014 | 0.0168 | 0.0396 |
| Service (not servant) | 0.0003 | 0.0014 | 0.1406 | 0.0325 |
| Agricultural (adjusted) | −0.0001 | 0.0035 | 0.1771 | 0.3232 |

*Notes:* This table presents average treatment effects calculated as the average treatment effect across the first ten fully treated birth cohorts in our event study design, categorized by major sectors of work. In HISCO, *Professional* encompasses major groups 0–1, including professional, technical, and related workers. *Administrative and managerial* encompasses major group 2, consisting of administrative and managerial workers. *Clerical* includes major group 3, covering clerical and related workers. *Sales* includes major group 4, encompassing sales workers. *Service* includes major group 5, consisting of service workers. *Agricultural* includes major group 6, covering agricultural, animal husbandry, and forestry workers, as well as fishermen and hunters. *Production* encompasses major groups 7–9, including production and related workers, transport equipment operators, and laborers. Standard errors are clustered at the school district level. The control mean is the sample mean of the dependent variable one cohort in advance of the hiring of the first female teacher. The sample consists of women born between 1840 and 1880, who are at least 20 years old at the time of observation.

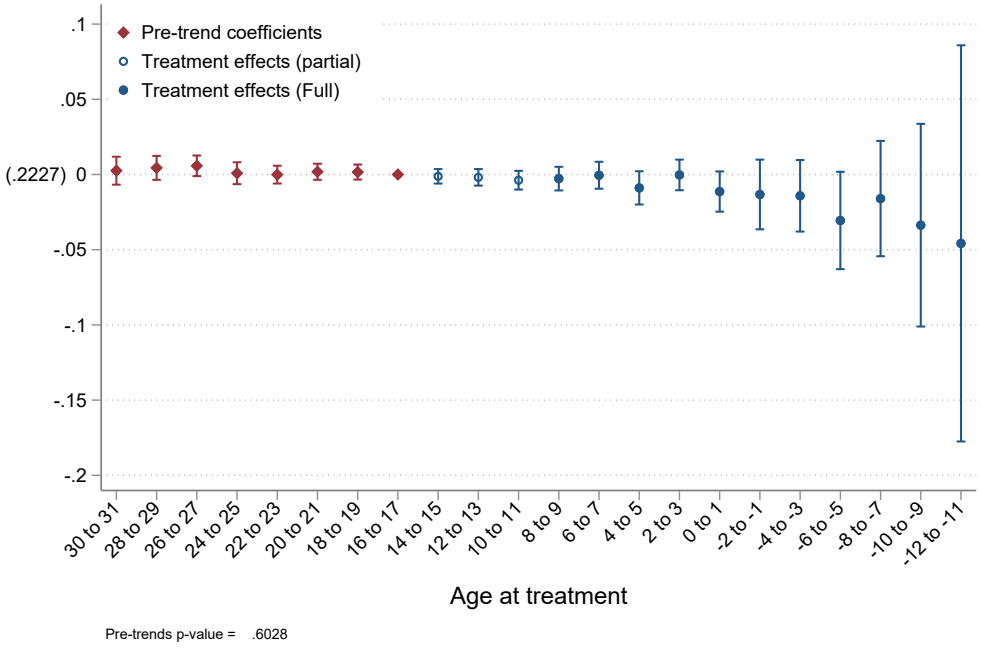
Table 4: HISCO In Context

| Sector of work | Three most common occupations |
|---|---|
| Professional | Teacher, Midwife, Nurse |
| Admin and Managerial | Housekeeper, Manager, Sales Manager |
| Clerical | Office Clerk, Telephone Switchboard Operator, Cashier |
| Sales | Retail Salesperson, Working Proprietor, Street Vendor |
| Service | House Servant, Personal Maid ,Charworker |
| Agricultural | General Farmer, Subsistence Farmer, Farm-Worker |
| Production | Hand and Machine Sewer, Worker , Day-Labourer |

*Notes:* Three most common HISCO five digit occupation unit groups (5-digits) for women across all censuses.

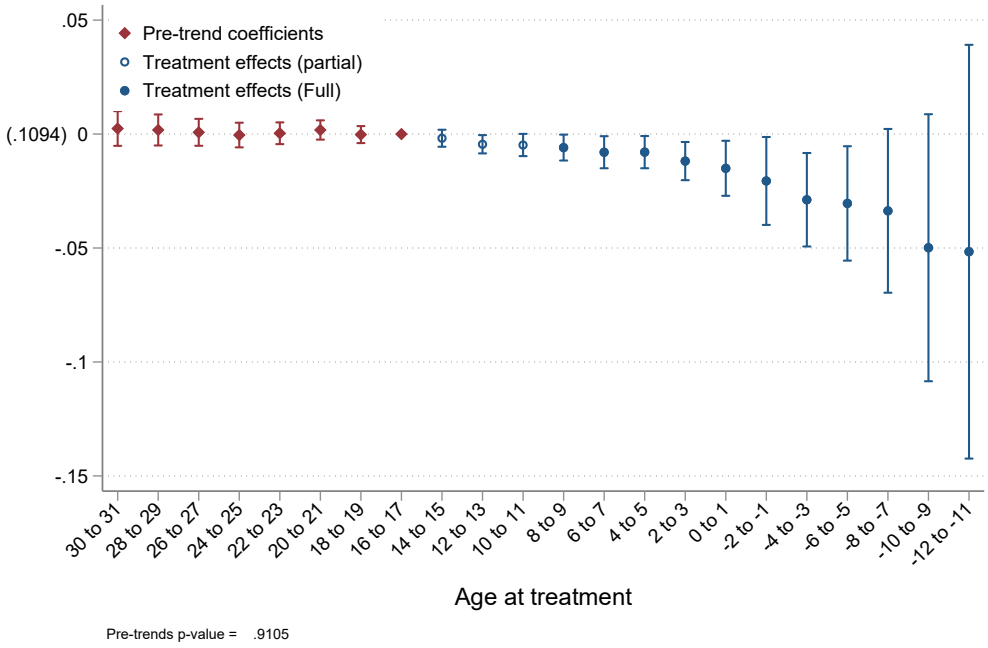
# Figures

FIGURE 1: LONG-RUN EFFECT OF THE FIRST FEMALE TEACHER ON WOMEN IN OCCUPATION



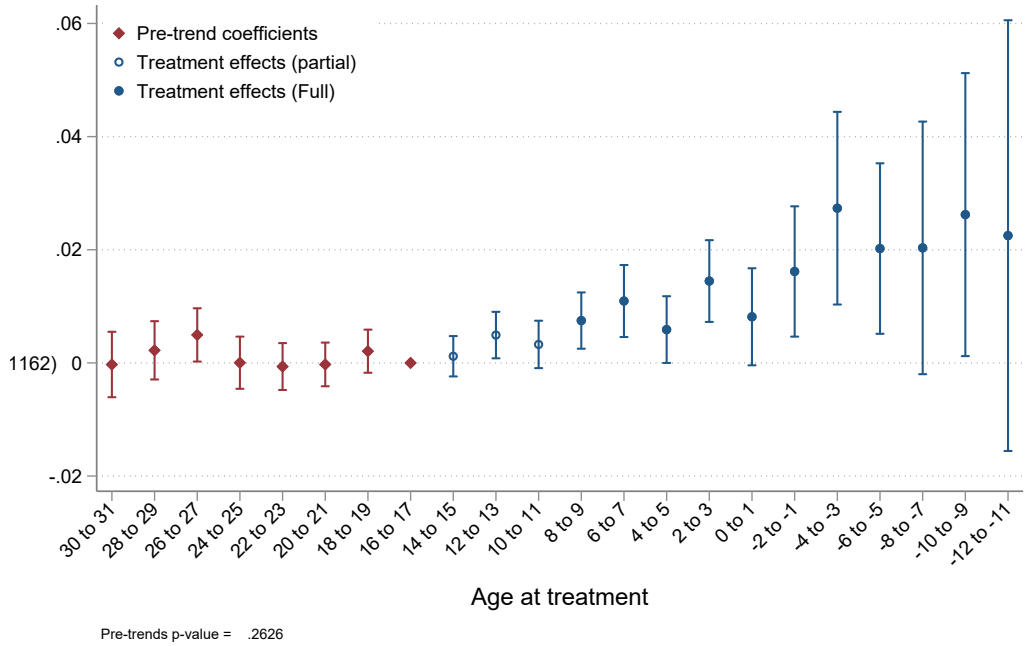

*Notes:* This figure plots the estimated coefficients (and 95 percent confidence intervals) obtained from an event study specification where the dependent variable is the share of women with an occupational title. All specifications include controls for school districts of birth-by-census year and birth cohort-by-census year fixed effects. Age at treatment 16 to 17 is the omitted category so estimates are relative to that point. Estimates are weighted using sample weights, which are based on the number of observations in each school district of birth-by-birth cohort-by-census year cell. Standard errors are clustered on the school district of birth. The parenthetic label next to the 0 point on the y-axis corresponds to the sample mean of the dependent variable one cohort in advance of the hiring of the first female teacher. The sample consists of women born between 1840 and 1880, and who are at least 20 years old at the time of observation.

FIGURE 2: LONG-RUN EFFECT OF THE FIRST FEMALE TEACHER ON WOMEN IN DOMESTIC WORK WITHIN HOUSEHOLDS



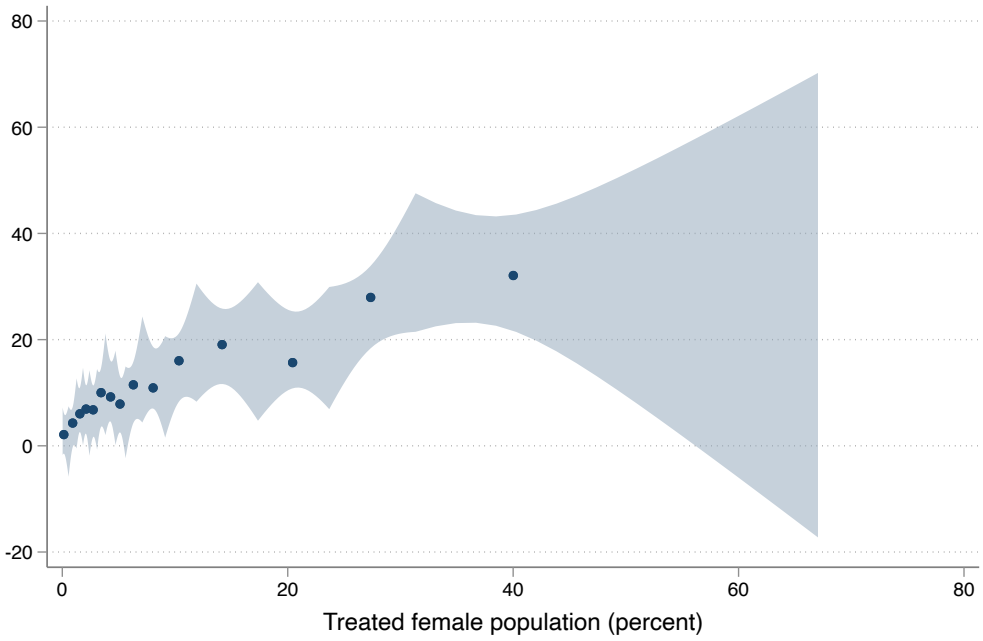

*Notes:* This figure plots the estimated coefficients (and 95 percent confidence intervals) obtained from an event study specification where the dependent variable is the share of women working as servants. All specifications include controls for school districts of birth-by-census year and birth cohort-by-census year fixed effects. Age at treatment 16 to 17 is the omitted category so estimates are relative to that point. Estimates are weighted using sample weights, which are based on the number of observations in each school district of birth-by-birth cohort-by-census year cell. Standard errors are clustered on the school district of birth. The parenthetic label next to the 0 point on the y-axis corresponds to the sample mean of the dependent variable one cohort in advance of the hiring of the first female teacher. The sample consists of women born between 1840 and 1880, and who are at least 20 years old at the time of observation.

FIGURE 3: LONG-RUN EFFECT OF THE FIRST FEMALE TEACHER ON WOMEN IN OCCUPATIONS OUTSIDE THE HOUSEHOLD



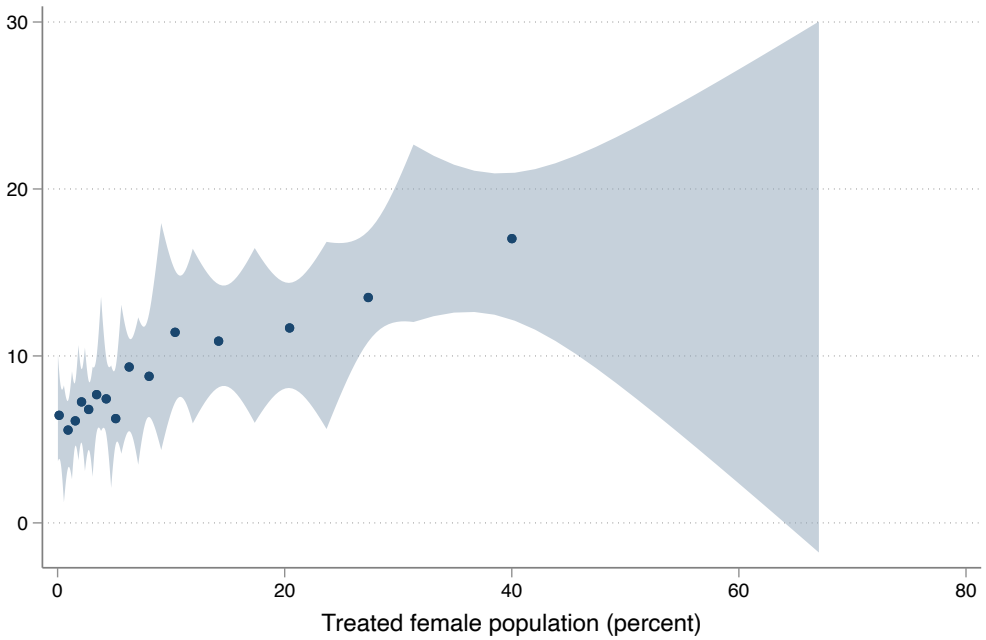

*Notes:* This figure plots the estimated coefficients (and 95 percent confidence intervals) obtained from an event study specification where the dependent variable is the share of women with an occupational title who do not work as servants. All specifications include controls for school districts of birth-by-census year and birth cohort-by-census year fixed effects. Age at treatment 16 to 17 is the omitted category so estimates are relative to that point. Estimates are weighted using sample weights, which are based on the number of observations in each school district of birth-by-birth cohort-by-census year cell. Standard errors are clustered on the school district of birth. The parenthetic label next to the 0 point on the y-axis corresponds to the sample mean of the dependent variable one cohort in advance of the hiring of the first female teacher. The sample consists of women born between 1840 and 1880, and who are at least 20 years old at the time of observation.

## Figure 4: Having a local women's suffrage chapter



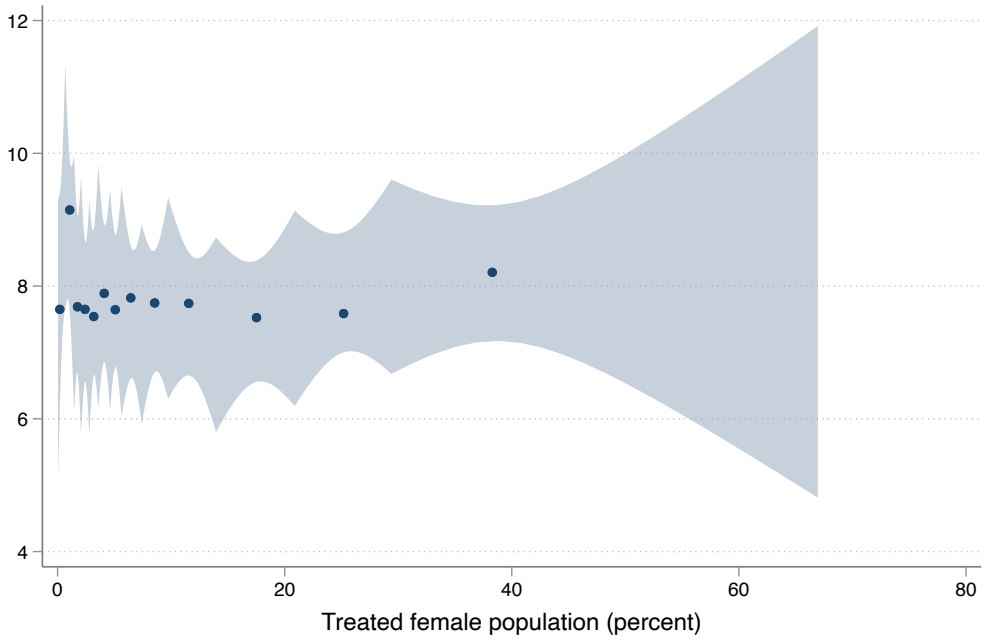

*Notes:* This figure plot a binscatter of a 100× a dummy for having a local chapter of the woman's suffrage organization NAWS at any time between 1902-1920 on the y-axis and the share of women (aged 30-70) who we measured as treated (partial or full) on the x-axis. The latter are divided by the 1910 population at the census unit or city level if a city consist of multiple census units (in addition census units with the same name as the city e.g. Växjö stadsförsamling and Växjö landsförsamling are grouped together). This results in 2,432 distinct geographic regions with well defined population in 1910. The location of local chapter are geocoded from digitized information from the universe of NWAS annual report. The binscatter is implemented using the Stata package `binsreg` with FE included for each percentile of population density in 1910. Confidence bands are constructed using linear polynomials and one smoothness constraint (Cattaneo et al., 2024).

FIGURE 5: PERCENTAGE OF WOMEN WHO SIGNED THE 1913–1914 SUFFRAGE PETITION



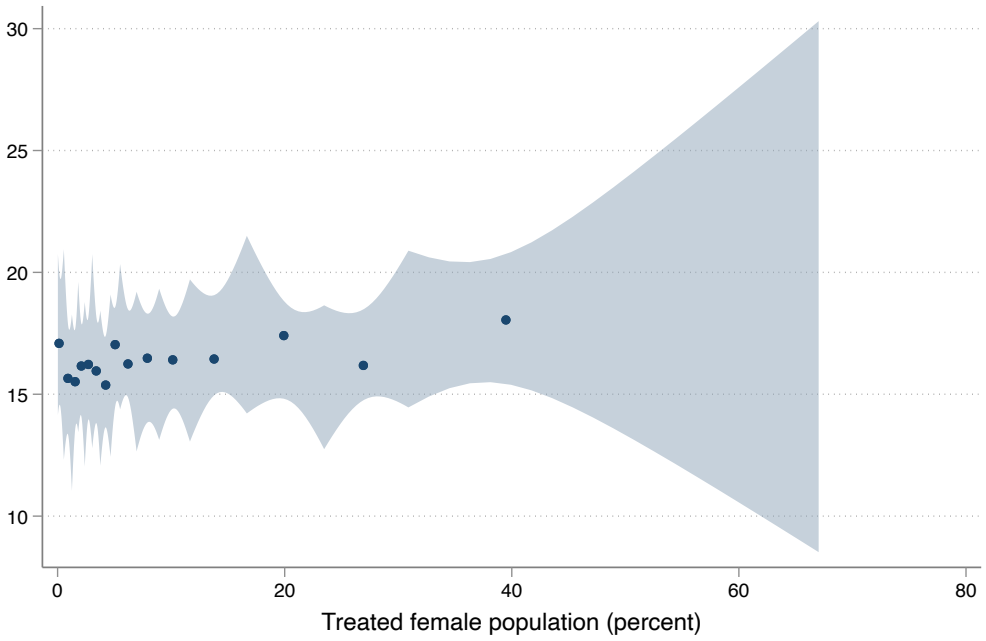

*Notes:* This figure plots a binscatter of the percentage of adult (21 and above) women who signed the 1913-14 mass petition for women suffrage on the y-axis and the share of women (aged 30-70) who we measured as treated (partial or full) on the x-axis. Both variables are divided by the 1910 population in respective group at the census unit or city level if a city consist of multiple census units (in addition census units with the same name as the city e.g. Växjö stadsförsamling and Växjö landsförsamling are grouped together). This results in 2,432 distinct geographic regions with well defined population in 1910. The location of signatures are geocoded from information transcribed by the National Archived of Sweden https://sok.riksarkivet.se/arkiv/gAVrJecRrH6d0G02H087k3. The binscatter is implemented using the Stata package `binsreg` with FE included for each percentile of population density in 1910. Confidence bands are constructed using linear polynomials and one smoothness constraint (Cattaneo et al., 2024).

Figure 6: Male-Female Turnout Gap In First Election After Equal Suffrage




*Notes:* This figure plots a binscatter of the male-female turnout gap in the county council election of 1919 (Landstingsmannavalet) on the y-axis and the share of women (aged 30-70) who we measured as treated (partial or full) on the x-axis. Male-female turnout gap is defined as the male turnout - female turnout. Both measured as ballots cast divided by eligible population. The treatment measure is divided by the 1910 population in the census unit or city level if a city consist of multiple census units (in addition census units with the same name as the city e.g. Växjö stadsförsamling and Växjö landsförsamling are grouped together). This results in 2,432 distinct geographic regions with well defined population in 1910. Turnout data are digitized and geocoded by the authors. Primary sources are available at the National Archives of Sweden https://sok.riksarkivet.se/arkiv/mGFbKsppUaAOIRDfpjRsK0. The binscatter is implemented using the Stata package `binsreg` with FE included for each percentile of population density in 1910. Confidence bands are constructed using linear polynomials and one smoothness constraint (Cattaneo et al., 2024).

FIGURE 7: PERCENT OF WOMEN ABOVE 21 WHO JOINED THE NAWS




*Notes:* This figure plot a binscatter of estimated percent of women in person voters in the county council election of 1919 (Landstingsmannavalet) on the y-axis and the share of women (aged 30-70) who we measured as treated (partial or full) on the x-axis. In person voting is the total number of ballots cast by women minus the proxy votes (by spouses or other) divided by the number of eligible women. The treatment measure is divided by the 1910 population in the census unit or city level if a city consist of multiple census units (in addition census units with the same name as the city e.g. Växjö stadsförsamling and Växjö landsförsamling are grouped together). This results in 2,432 distinct geographic regions with well defined population in 1910. Turnout data are digitized and geocoded by the authors. Primary sources are available at the National Archives of Sweden `https://sok.riksarkivet.se/arkiv/mGFbKsppUaAOIRDfpjRsK0`. The binscatter is implemented using the Stata package **`binsreg`** with FE included for each percentile of population density in 1910. Confidence bands are constructed using linear polynomials and one smoothness constraint (Cattaneo et al., 2024).

# Appendix A: Additional Tables and Figures

Table A1: The Rise of Primary Education, 1812–1910

| Year | Enrolment ratio (%) | School year in days | Teachers | Schools |
|---|---|---|---|---|
| 1812 | 5.4 | 36 | | |
| 1814 | | | | 957 |
| 1839 | | | 1,537 | 1,516 |
| 1843 | 21.2 | 60 | | |
| 1847 | | | | 2,785 |
| 1868 | 64.9 | 89 | 7,045 | 6,919 |
| 1890 | 72.9 | 122 | 13,508 | 10,563 |
| 1910 | 75.3 | 166 | 21,585 | 14,894 |

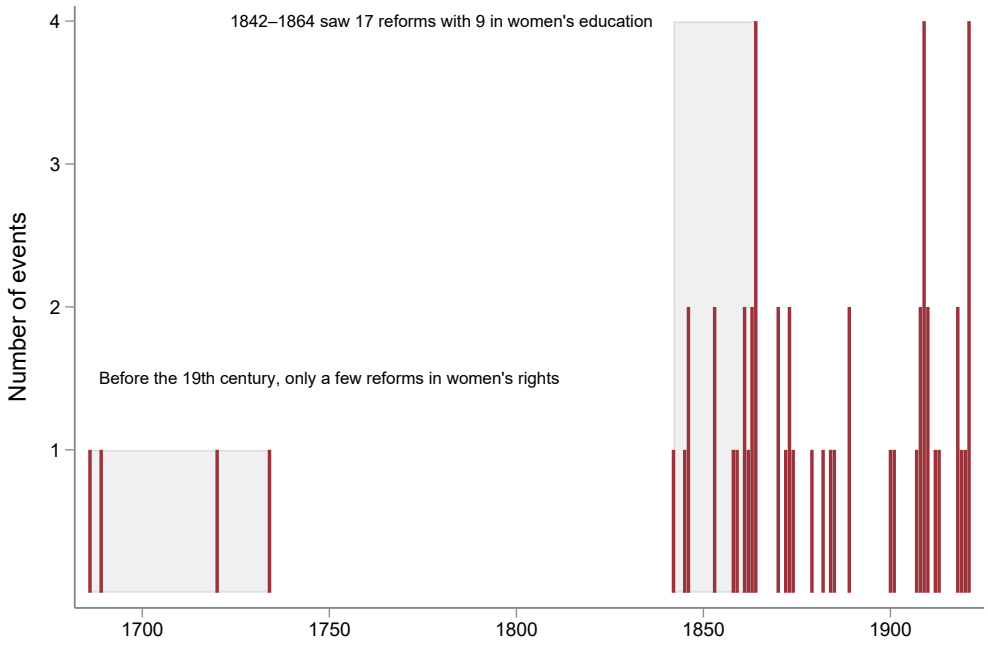
*Notes:* Primary school enrolment ratios for children aged 7–14 years. *Sources:* Carlson (1870) and Westberg (2017).

## Table A2: Fixed Effects Results

| Dependent variable: | Has occupation (= 1) | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Age: 20–29 | Age: 30–39 | Age: 40–49 | Census: 1910 |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Share female teachers | 0.108*** | 0.093*** | 0.049*** | 0.040*** | 0.036** | 0.058*** | 0.089*** | 0.064*** |
| | (0.025) | (0.028) | (0.011) | (0.012) | (0.016) | (0.010) | (0.014) | (0.010) |
| Census FEs | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Cohort FEs | No | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Urban FEs | No | No | Yes | No | Yes | Yes | Yes | Yes |
| Pct. pop. density in 1880 FEs | No | No | No | Yes | No | No | No | No |
| Censuses | 3 | 3 | 3 | 3 | 2 | 2 | 1 | 1 |
| Cohorts | 18 | 18 | 18 | 18 | 18 | 18 | 9 | 18 |
| School districts | 2223 | 2223 | 2223 | 2223 | 2223 | 2223 | 2219 | 2223 |
| Observations | 1655853 | 1655853 | 1655853 | 1655853 | 669749 | 600225 | 263472 | 578374 |
| Control mean | 0.236 | 0.236 | 0.236 | 0.236 | 0.298 | 0.181 | 0.181 | 0.189 |

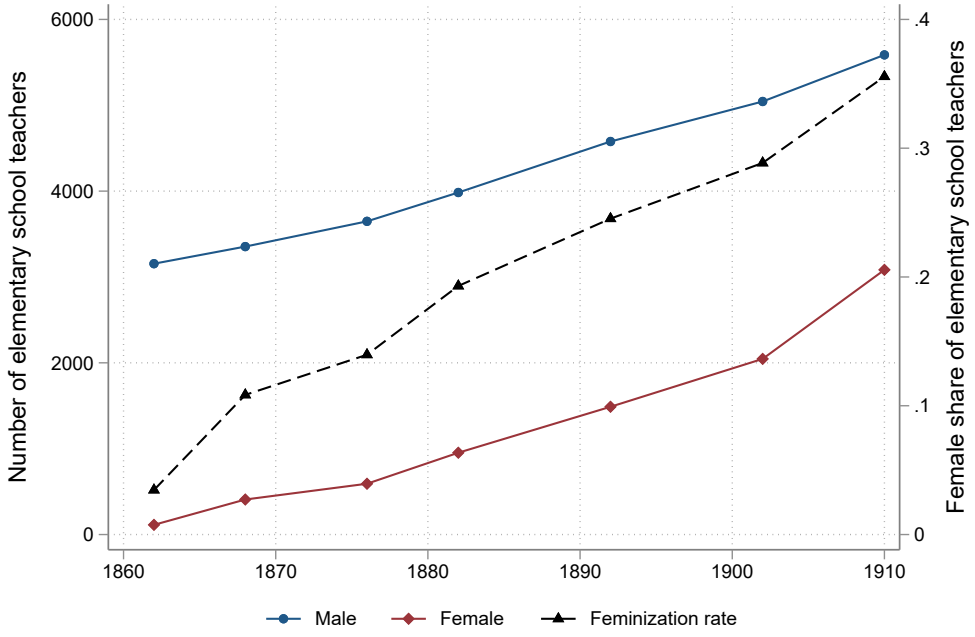
*Notes:* OLS regressions. The sample consists of women in the 1890, 1900, and 1910 censuses who were eligible for schooling in 1876, 1882, and 1889. The outcome is measured by age 16. The urban fixed effects are indicator variables indicating if the school district is urban or not, where urban is defined as having a population density above 1000 per square kilometer in the 1880 census. The urban school districts are school districts in the cities of Eskilstuna, Gothenburg, Gränna, Kalmar, Lund, Malmö, Norrköping, Stockholm, and Uppsala. Fixed effects are always interacted. Standard errors, in parentheses, are clustered at the school district level. *, **, and *** indicate significance at the 10%, 5% and 1% levels, respectively.

FIGURE A1: CRITICAL MOMENTS IN WOMEN'S RIGHTS HISTORY, SWEDEN, 1686–1921



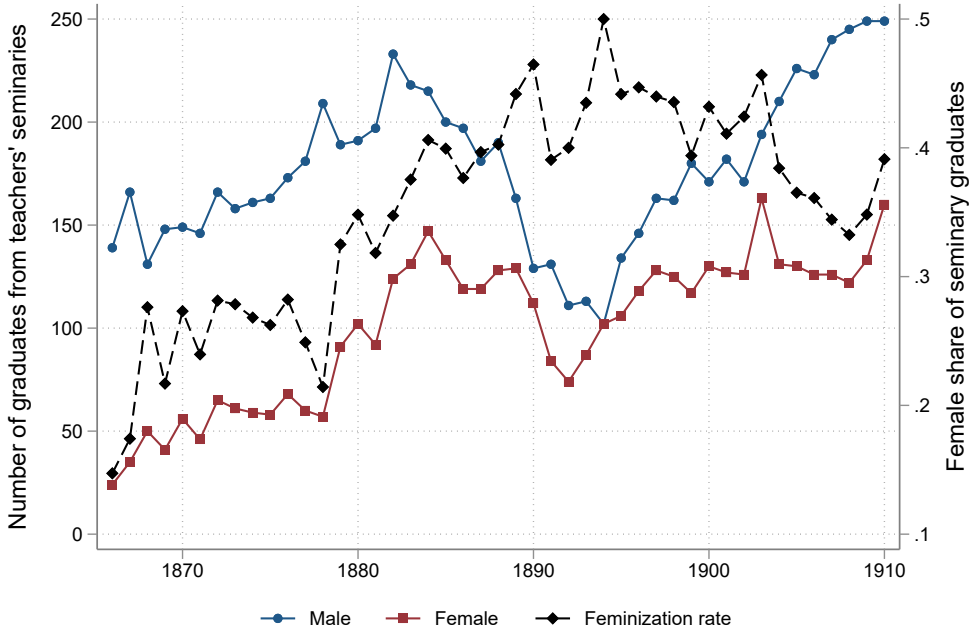

*Sources:* KvinnSam, Gothenburg University Library; Du Rietz (2013); Manns (1987); Wikipedia.

FIGURE A2: THE FEMINIZATION OF THE SWEDISH TEACHING PROFESSION



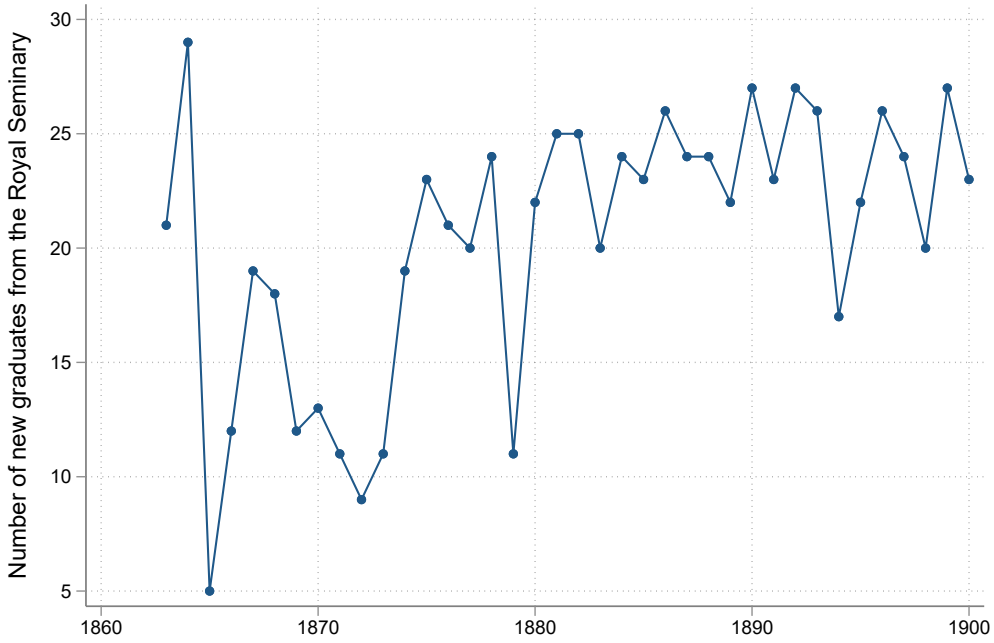

*Sources:* Archive of the Department of Ecclesiastics at the National Archive of Sweden; Statistics Sweden (BiSOS P).

FIGURE A3: TEACHERS' SEMINARY GRADUATES



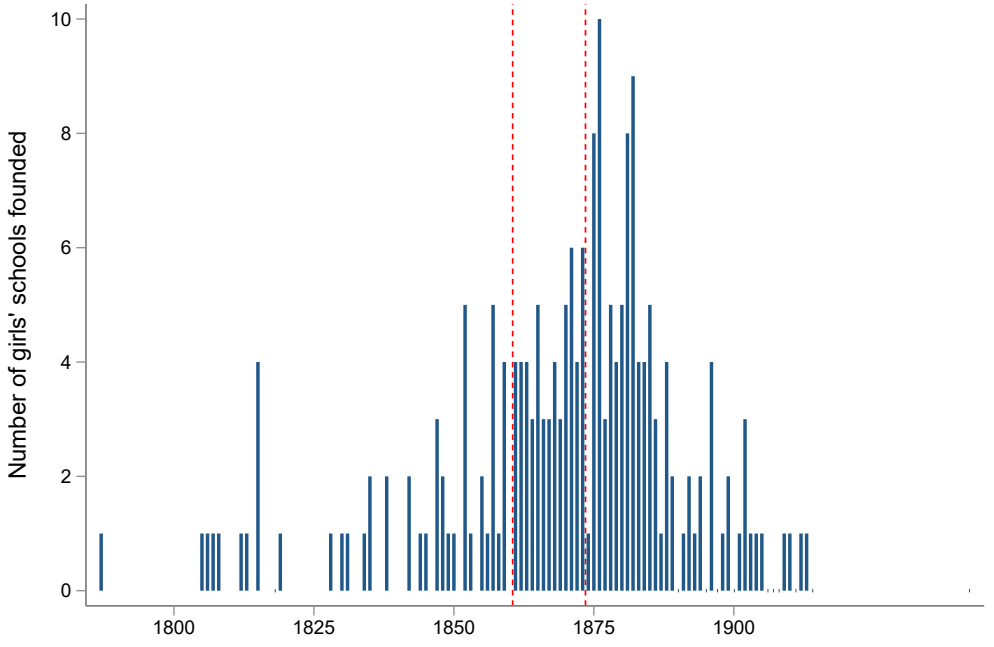

*Sources:* Folkundervisningskommittén (1912).

## Figure A4: Royal Seminary Graduates



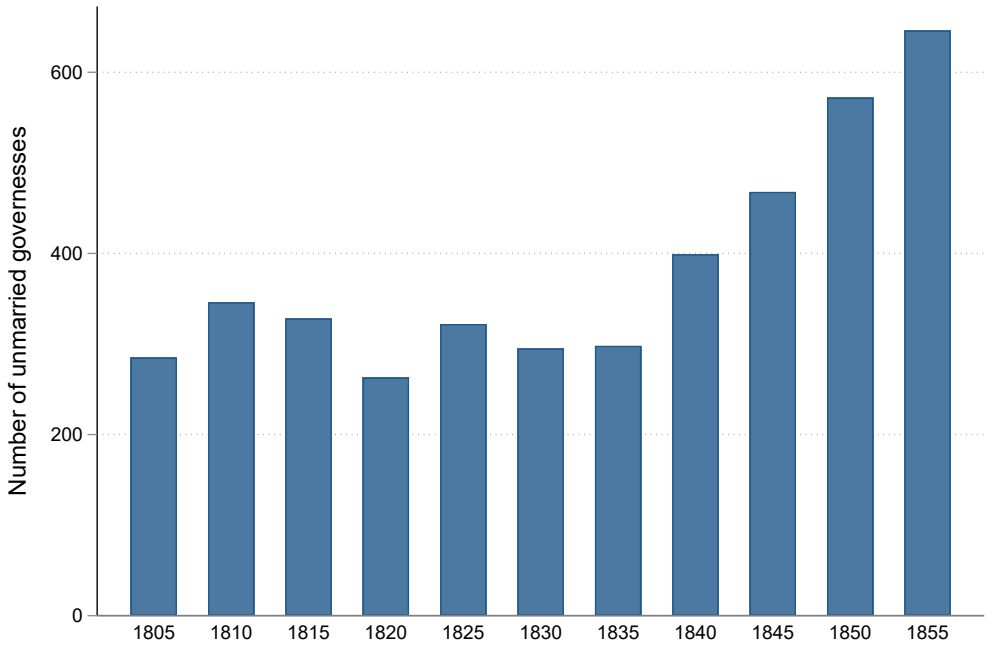

*Sources:* Archive Acc2000/30 (Kungliga Högre lärarinneseminariet) at the National Library of Sweden.

## Figure A5: Girls' Schools Before 1914




*Sources:* Heckscher (1914); Wikipedia.

Figure A6: Unmarried Governesses, 1805–1855




*Sources:* Statistics Sweden (1949).

Figure A7: Occupational Structure of Women in Sweden 1880–1910

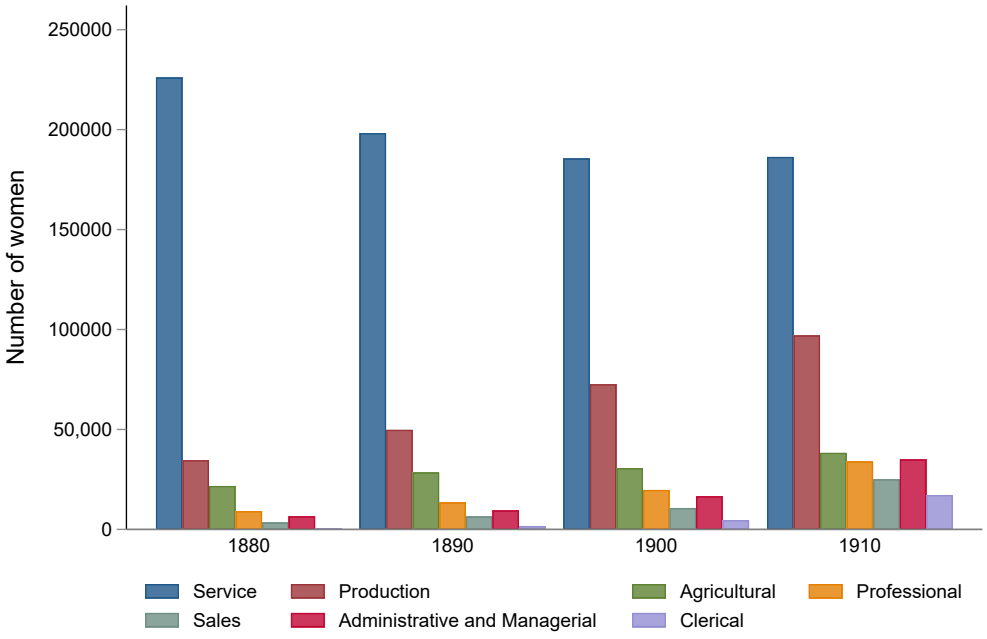


Figure A8: Occupational Structure of Women in Sweden 1880–1910

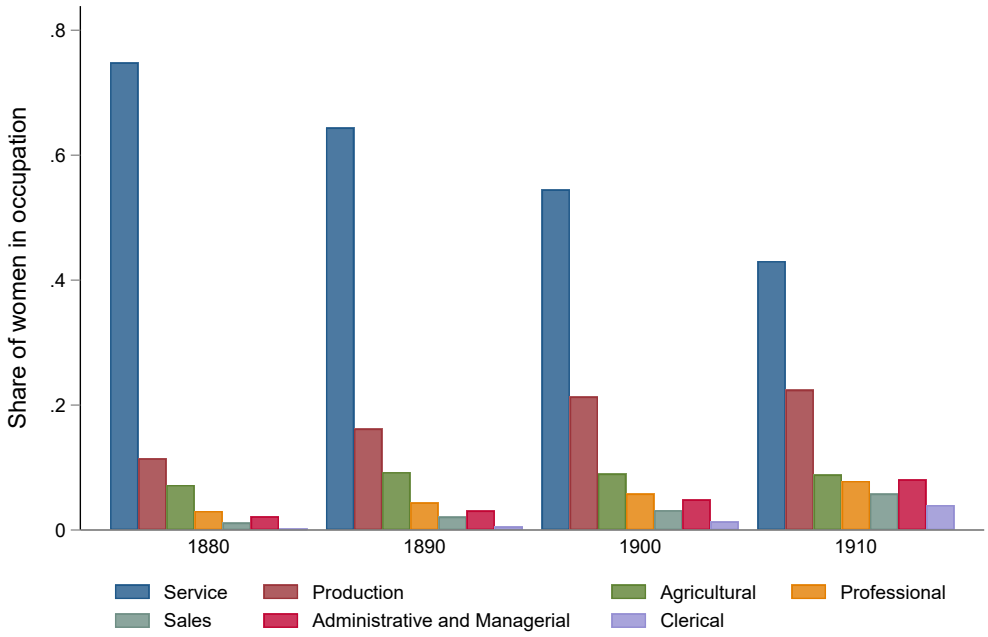



Figure A9: Occupational Structure of Women in Sweden 1860–1910 (excluding service and agriculture)

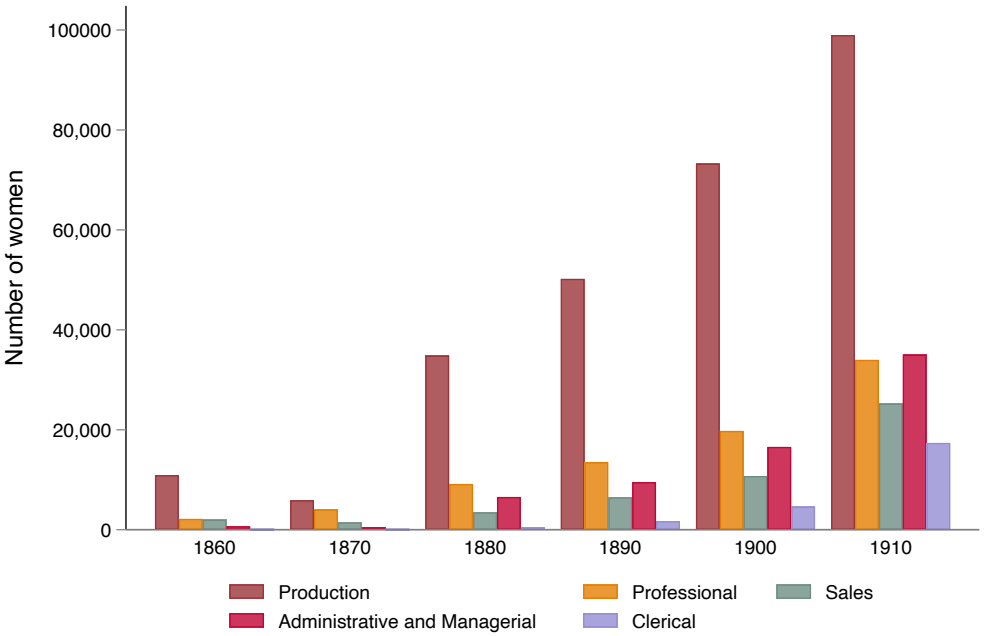
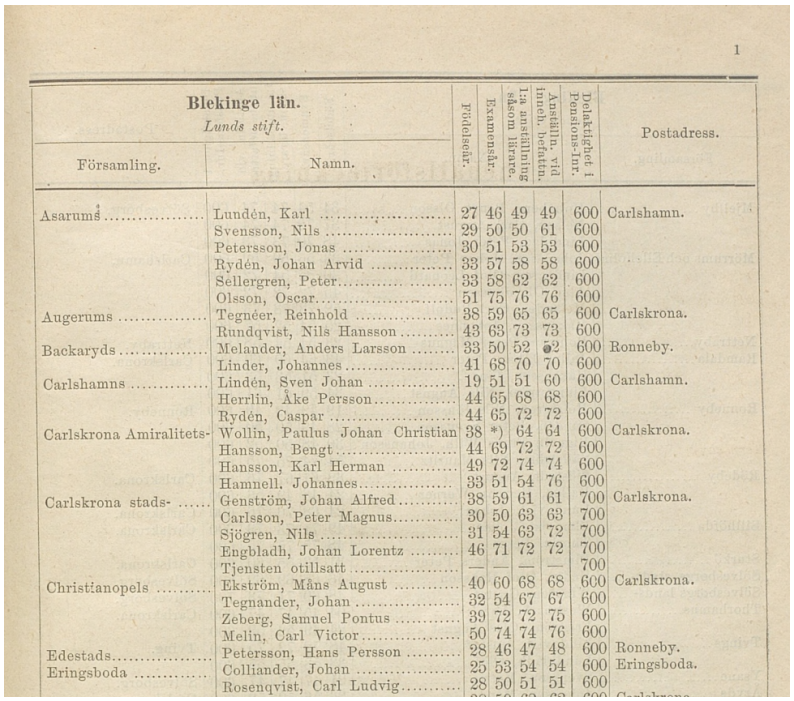
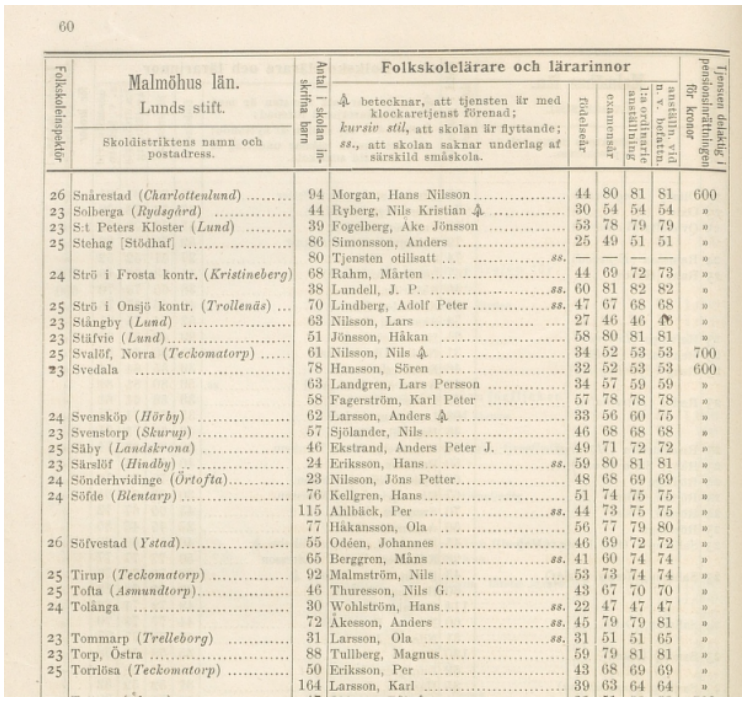


FIGURE A10: EXTRACT FROM 1876 SURVEY OF ELEMENTARY SCHOOL TEACHERS



1

| Blekinge län. *Lunds stift.* Församling. | Namn. | Födelseår. | Examensår. | I:a anställning såsom lärare. | Anställn. vid inneh. befattn. | Delaktighet i Pensions-inr. | Postadress. |
|---|---|---|---|---|---|---|---|
| Asarums | Lundén, Karl | 27 | 46 | 49 | 49 | 600 | Carlshamn. |
| | Svensson, Nils | 29 | 50 | 50 | 61 | 600 | |
| | Petersson, Jonas | 30 | 51 | 53 | 53 | 600 | |
| | Rydén, Johan Arvid | 33 | 57 | 58 | 58 | 600 | |
| | Sellergren, Peter | 33 | 58 | 62 | 62 | 600 | |
| | Olsson, Oscar | 51 | 75 | 76 | 76 | 600 | |
| Augerums | Tegnéer, Reinhold | 38 | 59 | 65 | 65 | 600 | Carlskrona. |
| | Rundqvist, Nils Hansson | 43 | 63 | 73 | 73 | 600 | |
| Backaryds | Melander, Anders Larsson | 33 | 50 | 52 | 52 | 600 | Ronneby. |
| | Linder, Johannes | 41 | 68 | 70 | 70 | 600 | |
| Carlshamns | Lindén, Sven Johan | 19 | 51 | 51 | 60 | 600 | Carlshamn. |
| | Herrlin, Åke Persson | 44 | 65 | 68 | 68 | 600 | |
| | Rydén, Caspar | 44 | 65 | 72 | 72 | 600 | |
| Carlskrona Amiralitets- | Wollin, Paulus Johan Christian | 38 | *) | 64 | 64 | 600 | Carlskrona. |
| | Hansson, Bengt | 44 | 69 | 72 | 72 | 600 | |
| | Hansson, Karl Herman | 49 | 72 | 74 | 74 | 600 | |
| | Hamnell, Johannes | 33 | 51 | 54 | 76 | 600 | |
| Carlskrona stads- | Genström, Johan Alfred | 38 | 59 | 61 | 61 | 700 | Carlskrona. |
| | Carlsson, Peter Magnus | 30 | 50 | 63 | 63 | 700 | |
| | Sjögren, Nils | 31 | 54 | 63 | 72 | 700 | |
| | Engbladh, Johan Lorentz | 46 | 71 | 72 | 72 | 700 | |
| | Tjensten otillsatt | — | — | — | — | 700 | |
| Christianopels | Ekström, Måns August | 40 | 60 | 68 | 68 | 600 | Carlskrona. |
| | Tegnander, Johan | 32 | 54 | 67 | 67 | 600 | |
| | Zeberg, Samuel Pontus | 39 | 72 | 72 | 75 | 600 | |
| | Melin, Carl Victor | 50 | 74 | 74 | 76 | 600 | |
| Edestads | Petersson, Hans Persson | 28 | 46 | 47 | 48 | 600 | Ronneby. |
| Eringsboda | Colliander, Johan | 25 | 53 | 54 | 54 | 600 | Eringsboda. |
| | Rosenqvist, Carl Ludvig | 28 | 50 | 51 | 51 | 600 | |

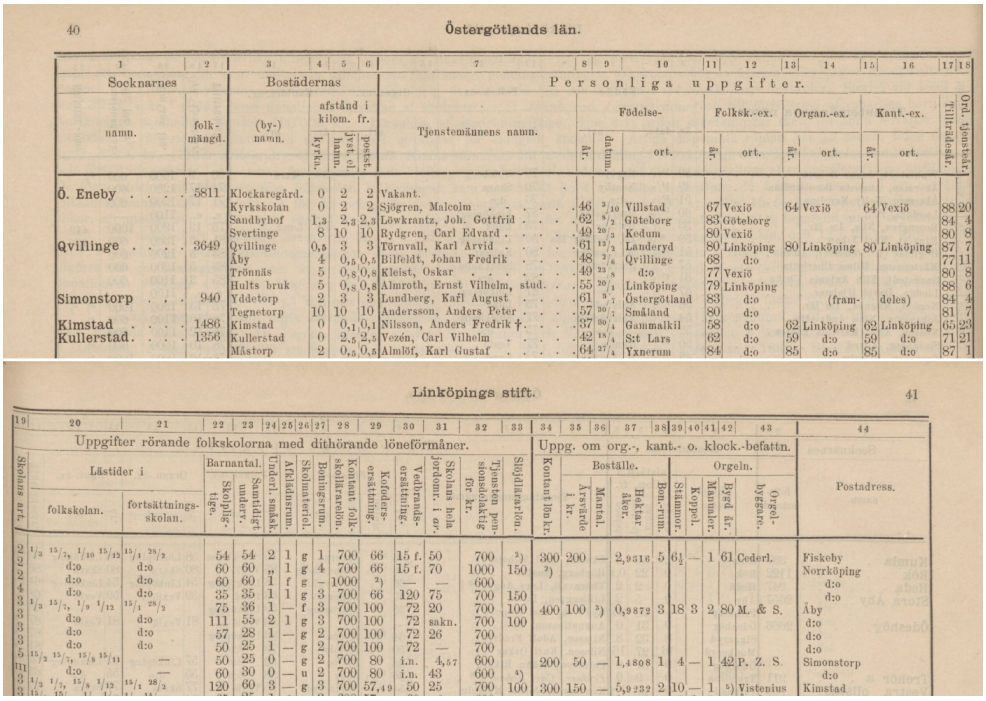


60

| Folkskoleinspektör | Malmöhus län. Lunds stift. Skoldistriktens namn och postadress. | Antal i skolan inskrifna barn | Folkskolelärare och lärarinnor. ⛪ betecknar, att tjensten är med klockaretjenst förenad; *kursiv stil*, att skolan är flyttande; *ss.*, att skolan saknar underlag af särskild småskola. | | | | | Tjensten delaktig i pensionsinrättningen för kronor |
|---|---|---|---|---|---|---|---|---|
| | | | | födelseår | examensår | I:a ordinarie anställning | Anställn. vid n. v. befattn. | |
| 26 | Snårestad (*Charlottenlund*) | 94 | Morgan, Hans Nilsson | 44 | 80 | 81 | 81 | 600 |
| 23 | Solberga (*Rydsgård*) | 44 | Ryberg, Nils Kristian ⛪ | 30 | 54 | 54 | 54 | » |
| 23 | S:t Peters Kloster (*Lund*) | 39 | Fogelberg, Åke Jönsson | 53 | 78 | 79 | 79 | » |
| 25 | Stehag [Stödhaf] | 86 | Simonsson, Anders | 25 | 49 | 51 | 51 | » |
| | | 80 | Tjensten otillsatt | — | — | — | — | » |
| 24 | Strö i Frosta kontr. (*Kristineberg*) | 68 | Rahm, Mårten | 44 | 69 | 72 | 73 | » |
| | | 38 | Lundell, J. P. *ss.* | 60 | 81 | 82 | 82 | » |
| 25 | Strö i Onsjö kontr. (*Trollenäs*) | 70 | Lindberg, Adolf Peter *ss.* | 47 | 67 | 68 | 68 | » |
| 23 | Stångby (*Lund*) | 63 | Nilsson, Lars | 27 | 46 | 46 | 46 | » |
| 23 | Stäfvie (*Lund*) | 51 | Jönsson, Håkan | 58 | 80 | 81 | 81 | » |
| 25 | Svalöf, Norra (*Teckomatorp*) | 61 | Nilsson, Nils ⛪ | 34 | 52 | 53 | 53 | 700 |
| 23 | Svedala | 78 | Hansson, Sören | 32 | 52 | 53 | 53 | 600 |
| | | 63 | Landgren, Lars Persson | 34 | 57 | 59 | 59 | » |
| | | 58 | Fagerström, Karl Peter | 57 | 78 | 78 | 78 | » |
| 24 | Svensköp (*Hörby*) | 62 | Larsson, Anders ⛪ | 33 | 56 | 60 | 75 | » |
| 23 | Svenstorp (*Skurup*) | 57 | Sjölander, Nils | 46 | 68 | 68 | 68 | » |
| 25 | Säby (*Landskrona*) | 46 | Ekstrand, Anders Peter J. | 49 | 71 | 72 | 72 | » |
| 23 | Särslöf (*Hindby*) | 24 | Eriksson, Hans *ss.* | 59 | 80 | 81 | 81 | » |
| 24 | Sönderhvidinge (*Örtofta*) | 23 | Nilsson, Jöns Petter | 48 | 68 | 69 | 69 | » |
| 24 | Söfde (*Blentarp*) | 76 | Kellgren, Hans | 51 | 74 | 75 | 75 | » |
| | | 115 | Ahlbäck, Per *ss.* | 44 | 73 | 75 | 75 | » |
| | | 77 | Håkansson, Ola | 56 | 77 | 79 | 80 | » |
| 26 | Söfvestad (*Ystad*) | 55 | Odéen, Johannes | 46 | 69 | 72 | 72 | » |
| | | 65 | Berggren, Måns *ss.* | 41 | 60 | 74 | 74 | » |
| 25 | Tirup (*Teckomatorp*) | 92 | Malmström, Nils | 53 | 73 | 74 | 74 | » |
| 25 | Tofta (*Asmundtorp*) | 46 | Thuresson, Nils G. | 43 | 67 | 70 | 70 | » |
| 24 | Tolånga | 30 | Wohlström, Hans *ss.* | 22 | 47 | 47 | 47 | » |
| | | 72 | Åkesson, Anders *ss.* | 45 | 79 | 79 | 81 | » |
| 23 | Tommarp (*Trelleborg*) | 31 | Larsson, Ola *ss.* | 31 | 51 | 51 | 65 | » |
| 23 | Torp, Östra | 88 | Tullberg, Magnus | 59 | 79 | 81 | 81 | » |
| 25 | Torrlösa (*Teckomatorp*) | 50 | Eriksson, Per | 43 | 68 | 69 | 69 | » |
| | | 164 | Larsson, Karl | 39 | 63 | 64 | 64 | » |

FIGURE A11: EXTRACT FROM 1882 SURVEY OF ELEMENTARY SCHOOL TEACHERS

FIGURE A12: EXTRACT FROM 1889 SURVEY OF ELEMENTARY SCHOOL TEACHERS



40 Östergötlands län.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Socknarnes | | Bostädernas | afstånd i kilom. fr. | | | Personliga uppgifter. | | | | | | | | | | | |
| namn. | folkmängd. | (by-) namn. | kyrka. | järnv. el. hamn. | postst. | Tjenstemännens namn. | Födelse- år. | datum. | ort. | Folksk.-ex. år. | ort. | Organ.-ex. år. | ort. | Kant.-ex. år. | ort. | Tillträdesår. | Ord. tjenstår. |
| Ö. Eneby | 5811 | Klockaregård. | 0 | 2 | 2 | Vakant. | | | | | | | | | | | |
| | | Kyrkskolan | 0 | 2 | 2 | Sjögren, Malcolm | 46 | 3/10 | Villstad | 67 | Vexiö | 64 | Vexiö | 64 | Vexiö | 88 | 20 |
| | | Sandbyhof | 1,3 | 2,3 | 2,3 | Löwkrantz, Joh. Gottfrid | 62 | 8/2 | Göteborg | 83 | Göteborg | | | | | 84 | 4 |
| | | Svertinge | 8 | 10 | 10 | Rydgren, Carl Edvard | 49 | 20/3 | Kedum | 80 | Vexiö | | | | | 80 | 8 |
| Qvillinge | 3649 | Qvillinge | 0,5 | 3 | 3 | Törnvall, Karl Arvid | 61 | 13/4 | Landeryd | 80 | Linköping | 80 | Linköping | 80 | Linköping | 87 | 7 |
| | | Åby | 4 | 0,5 | 0,5 | Bilfeldt, Johan Fredrik | 48 | 2/4 | Qvillinge | 68 | d:o | | | | | 77 | 11 |
| | | Trönnäs | 5 | 0,8 | 0,8 | Kleist, Oskar | 49 | 23/8 | d:o | 77 | Vexiö | | | | | 80 | 8 |
| | | Hults bruk | 5 | 0,8 | 0,8 | Almroth, Ernst Vilhelm, stud. | 55 | 20/1 | Linköping | 79 | Linköping | | | | | 88 | 6 |
| Simonstorp | 940 | Yddetorp | 2 | 3 | 3 | Lundberg, Karl August | 61 | 9/1 | Östergötland | 83 | d:o | | (fram- | | deles) | 84 | 4 |
| | | Tegnetorp | 10 | 10 | 10 | Andersson, Anders Peter | 57 | 30/1 | Småland | 80 | d:o | | | | | 81 | 7 |
| Kimstad | 1486 | Kimstad | 0 | 0,1 | 0,1 | Nilsson, Anders Fredrik † | 37 | 30/1 | Gammalkil | 58 | d:o | 62 | Linköping | 62 | Linköping | 65 | 23 |
| Kullerstad | 1356 | Kullerstad | 0 | 2,5 | 2,5 | Vezén, Carl Vilhelm | 42 | 18/4 | S:t Lars | 62 | d:o | 59 | d:o | 59 | d:o | 71 | 21 |
| | | Måstorp | 2 | 0,5 | 0,5 | Almlöf, Karl Gustaf | 64 | 27/4 | Yxnerum | 84 | d:o | 85 | d:o | 85 | d:o | 87 | 1 |

Linköpings stift. 41

| 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | 41 | 42 | 43 | 44 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Uppgifter rörande folkskolorna med dithörande löneförmåner. | | | | | | | | | | | | | | | Uppg. om org.-, kant.- o. klock.-befattn. | | | | | | | | | |
| Skolans art. | Lästider i folkskolan. | Lästider i fortsättningsskolan. | Barnantal. Skolpliktige. | Barnantal. Samtidigt undervisade. | Afklädningsrum. | Undervisningsmaterial. | Skolmaterial. | Boningsrum. | Kontant folkskollärarelön. | Kofoders-ersättning. | Vedbrandsersättning. | Skolans hela jordomr. i ar. | Tjensten pensionsgill. för kr. | Stöldfallarlön. | Kontant lön kr. | Boställe. Årsvärde i kr. | Boställe. Mantal. | Boställe. Hektar åker. | Boställe. Bon.-rum. | Orgeln. Stämmor. | Orgeln. Koppel. | Orgeln. Manualer. | Orgeln. Byggd år. | Orgeln. Orgelbyggare. | Postadress. |
| 2 | 1/8 15/11 1/10 15/12 | 15/1 28/2 | 54 | 54 | 2 | 1 | | 1 | 700 | 66 | 15 f. | 50 | 700 | 3) | 300 | 200 | — | 2,9316 | 5 | 6½ | — | 1 | 61 | Cederl. | Fiskeby |
| 2 | d:o | d:o | 60 | 60 | 1 | 1 | | 4 | 700 | 66 | 15 f. | 70 | 1000 | 150 | 2) | | | | | | | | | | Norrköping |
| 2 | d:o | d:o | 60 | 60 | 1 | f | | — | 1000 | 3) | — | — | 600 | | | | | | | | | | | | d:o |
| 3 | d:o | d:o | 35 | 35 | 1 | 1 | | 3 | 700 | 66 | 120 | 75 | 700 | 150 | | | | | | | | | | | d:o |
| 3 | 1/8 15/11 1/9 1/12 | 15/1 28/2 | 75 | 36 | 1 | — | | 3 | 700 | 100 | 72 | 20 | 700 | 100 | 400 | 100 | 3) | 0,9872 | 3 | 18 | 3 | 2 | 80 | M. & S. | Åby |
| 3 | d:o | d:o | 111 | 55 | 2 | 1 | | 3 | 700 | 100 | 72 | sakn. | 700 | 100 | | | | | | | | | | | d:o |
| 2 | d:o | d:o | 57 | 28 | 1 | — | | 2 | 700 | 100 | 72 | 26 | 700 | | | | | | | | | | | | d:o |
| 2 | d:o | d:o | 50 | 25 | 1 | — | | 2 | 700 | 100 | 72 | — | 700 | | | | | | | | | | | | d:o |
| 5 | 15/2 15/11 15/8 15/11 | — | 50 | 25 | 0 | — | | 2 | 700 | 80 | i.n. | 4,57 | 600 | | 200 | 50 | — | 1,4808 | 1 | 4 | — | 1 | 42 | P. Z. S. | Simonstorp |
| 3 | d:o | — | 60 | 30 | 0 | — | | 2 | 700 | 80 | i.n. | 43 | 600 | 5) | | | | | | | | | | | d:o |
| 3 | 1/8 1/11 15/8 1/12 | 15/1 28/2 | 120 | 60 | 3 | — | | 3 | 700 | 57,49 | 50 | 25 | 700 | 100 | 300 | 150 | — | 5,9232 | 2 | 10 | — | 1 | 5) | Ystenius | Kimstad |

Figure A13: Female teachers in 1876

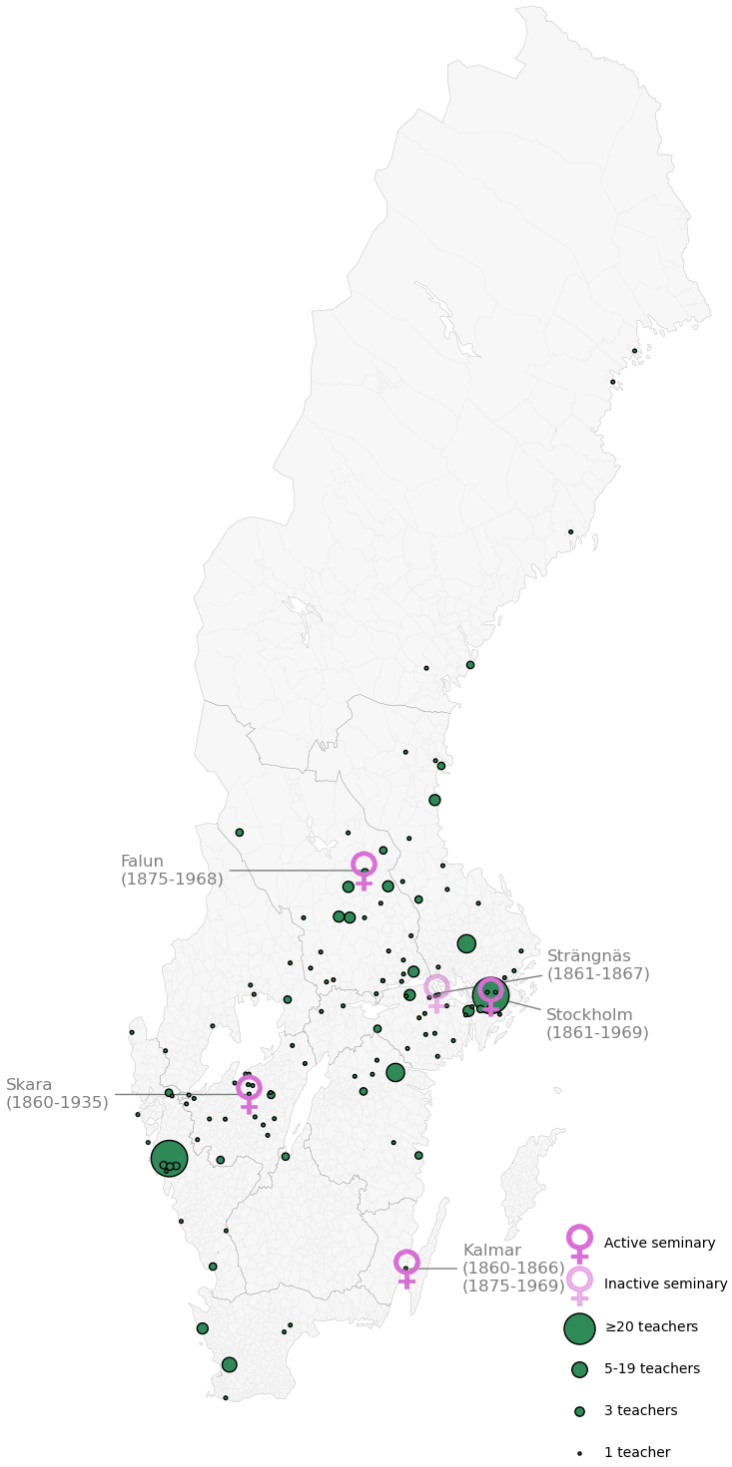


Figure A14: Female teachers in 1882

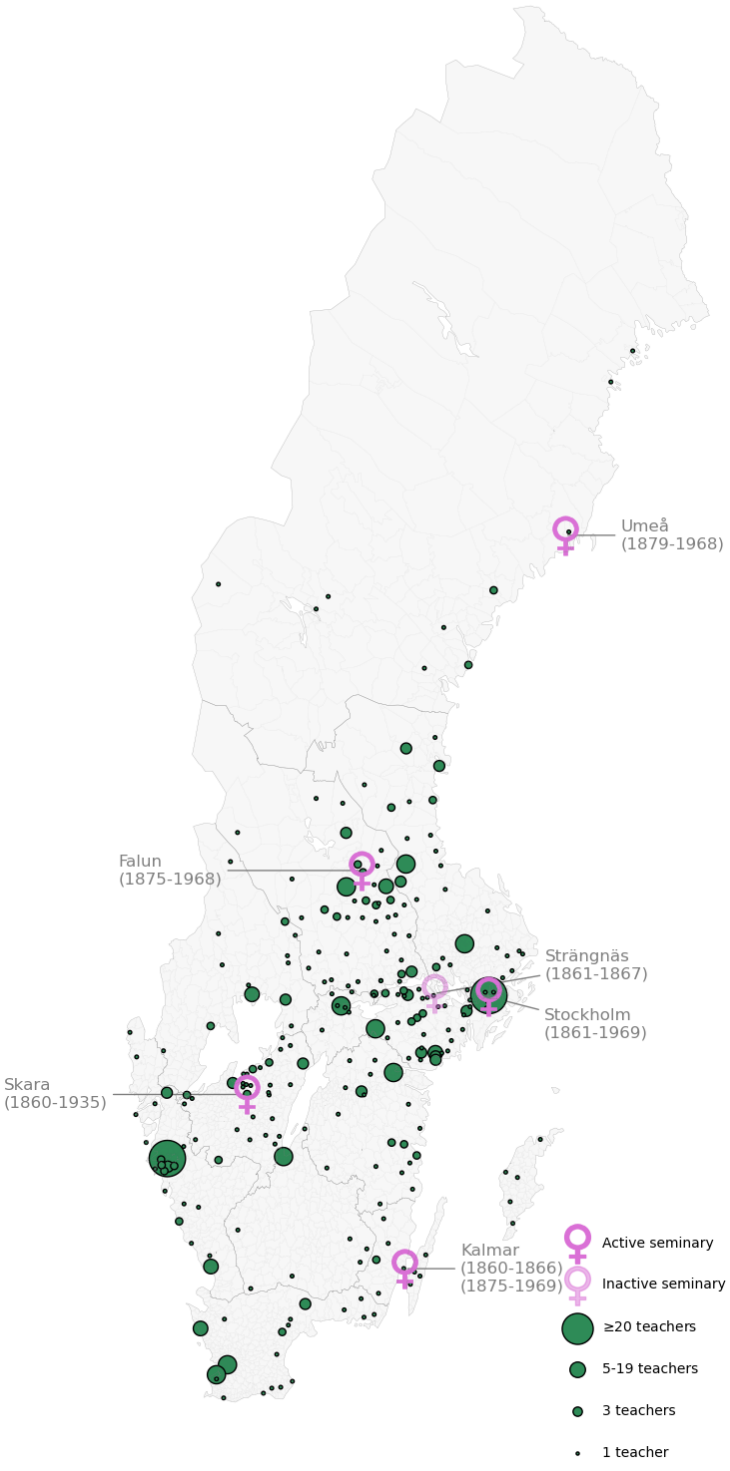


Figure A15: Female teachers in 1889

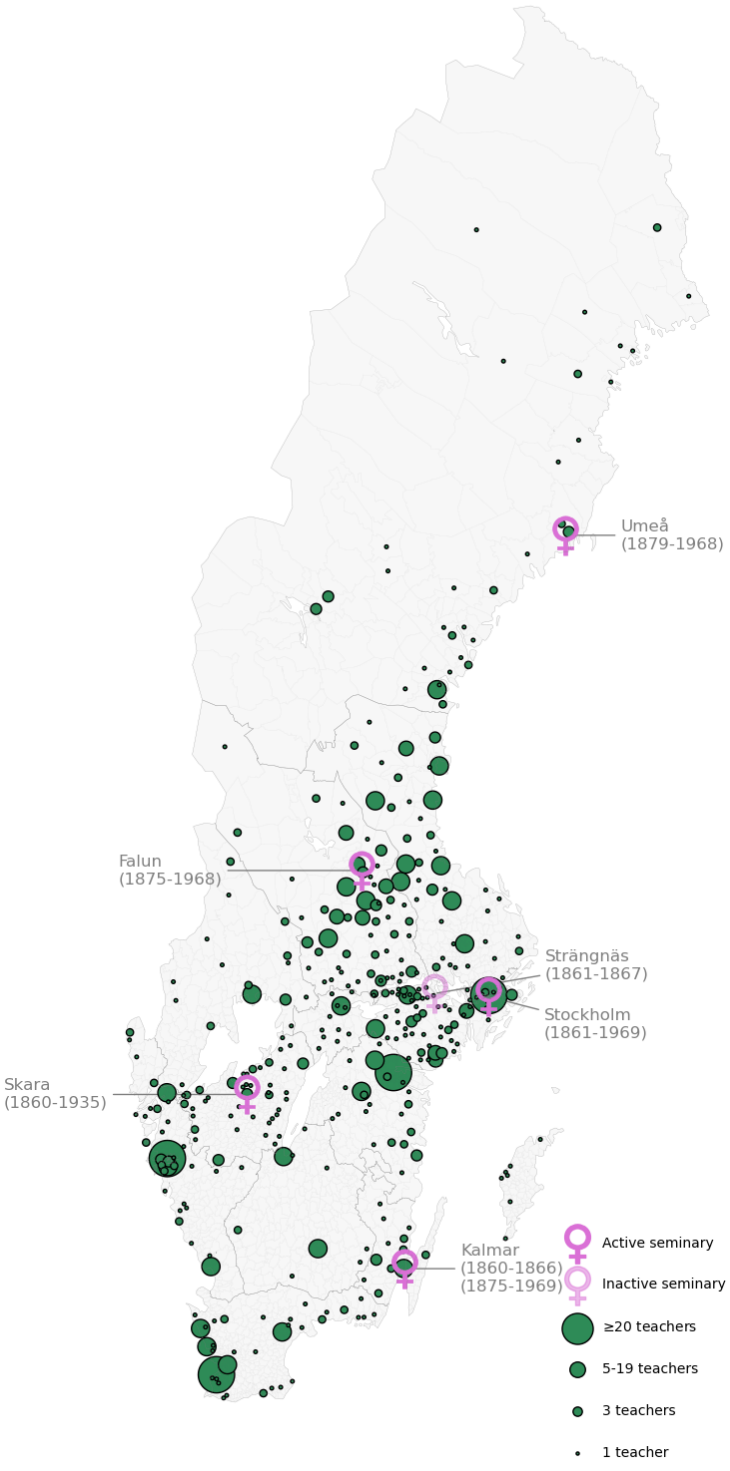
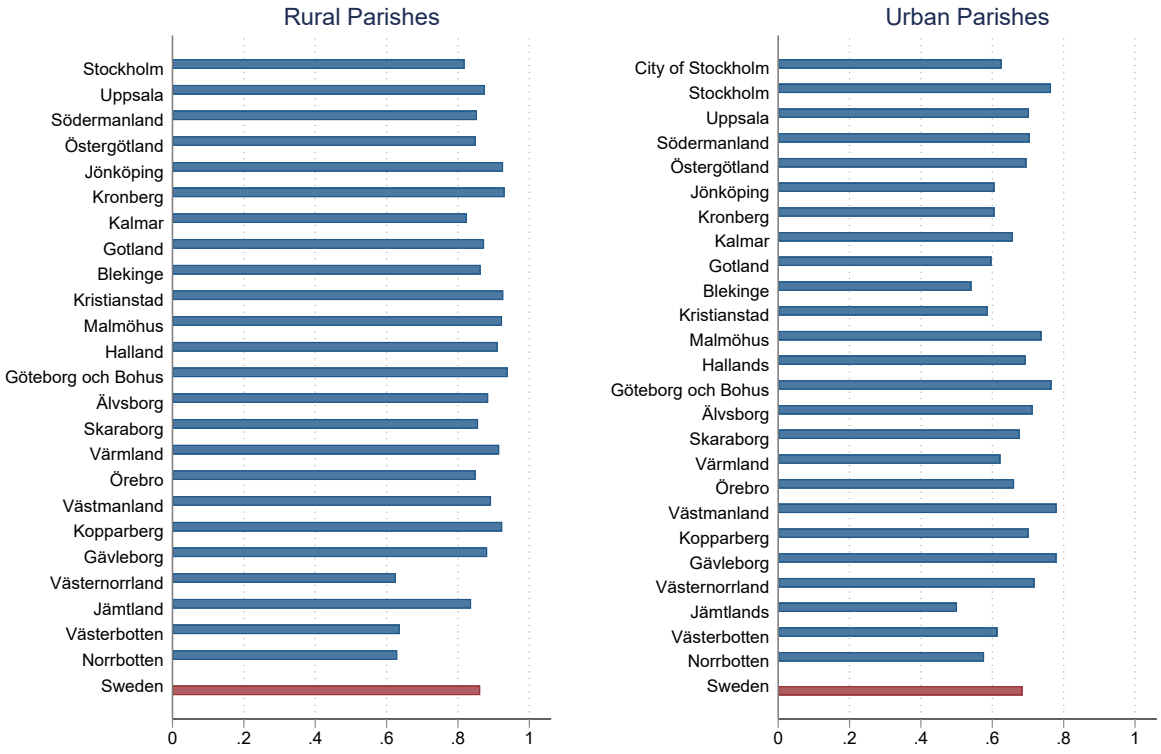


FIGURE A16: PRIMARY SCHOOL ENROLMENT RATIOS FOR CHILDREN AGED 7–14 IN 1882




*Sources:* Department of Ecclesiastics (1887).

Figure A17: Treatment status (purple = 1) by timing group

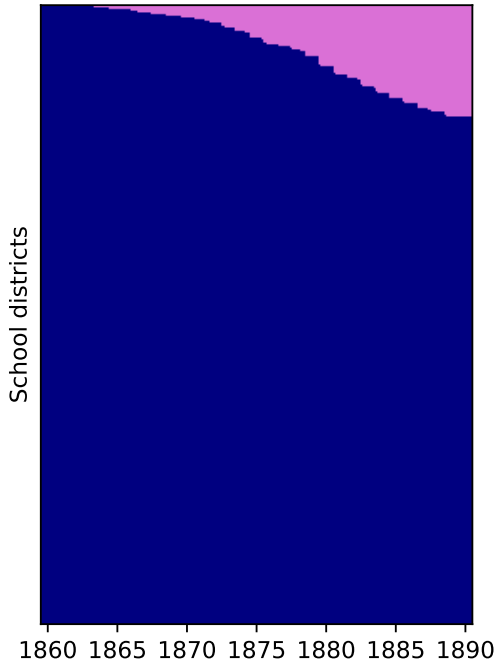
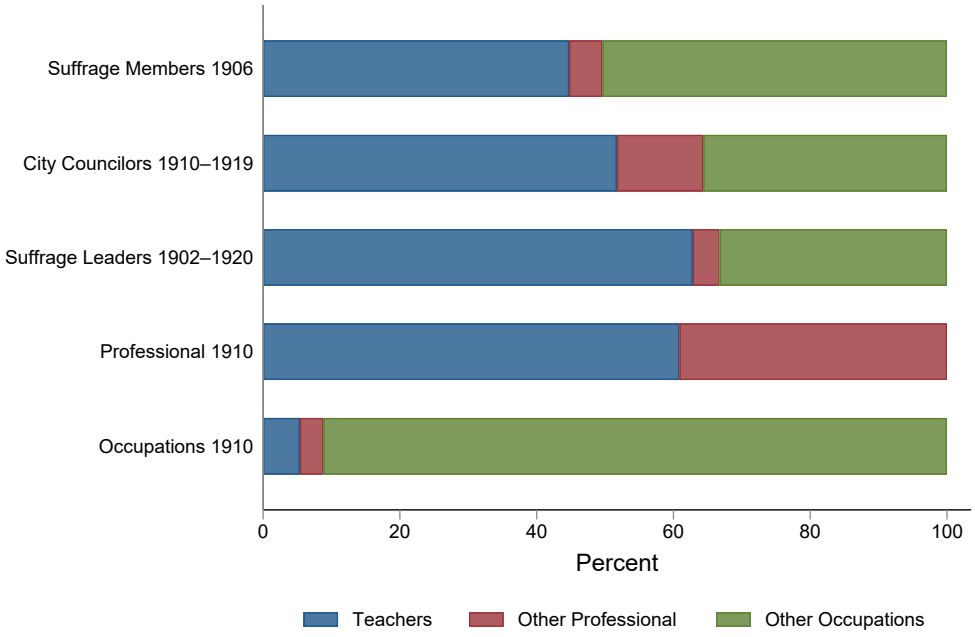



Figure A18: Average share of female teachers in districts hiring females Pre 1890

FIGURE A19: OCCUPATIONS IN SELECTED GROUPS OF WOMEN



## Appendix B: Robustness Checks

To be updated.

## Appendix C: Creating Stable School Districts

To be updated.