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30 November 2023

Online at <https://mpra.ub.uni-muenchen.de/119319/>
MPRA Paper No. 119319, posted 04 Dec 2023 01:34 UTC

CENSUS-BASED COMPARABILITY OF DATA ON LITERACY PROCESSES IN WESTERN EUROPE

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ABSTRACT

A comparative picture of the literacy processes in Western Europe on the eve of and during the Second Industrial Revolution is provided, taking censal literacy rates as a yardstick to measure and compare literacy in different countries. If only partial or insufficient censal data are available, literacy is assessed as if given by full censal data. Four literacy groups result. The area of Western Europe where mass literacy was first achieved was the German-speaking or culturally highly Germanised zone. Britain and Sweden turn out to be in the same cluster as France. The periphery of Western Europe shows the well-known pattern of delayed literacy development.

1. INTRODUCTION

This article provides a comparative picture of the literacy processes in Western Europe on the eve of and during the Second Industrial Revolution (generally dated between 1870 and 1914), taking as a yardstick “modern census” data. The aim is not the construction of explicative models, but the harmonization of data (as far as possible) to enable comparisons.

In order to estimate the literacy level of a population, we face considerable problems, conceptual and practical, especially when we go back in time¹. The advent of “modern censuses” in the mid-19th century opened new possibilities for the measurement of literacy. In modern censuses data were obtained on all individuals present in the household on the specified census day. Information was self-reported by the household heads through household forms (later individual forms). A field force of professional enumerators was employed to assist in the process from house to house (especially if there was no one in the house who could write) and collect the forms².

¹ As for the pre-statistical age, the main tool of analysis is considering who could sign and who could not sign in documents (such as marriage certificates, deeds, wills, etc.), and even the quality of the signatures. Apart from the issue of how representative of the population is the sample in each case, the ability of an individual to write his/her name does not entail, in principle, a general ability to read or write, although there can be statistical correlations (see Furet and Sachs 1974).

² See Baffour et al. (2013) about modern censuses and their evolution.

All modern censuses had a similar basic methodology, and thus comparisons between countries are made easier³. In this paper we shall take censal literacy rates as a yardstick to measure and compare literacy in different countries. If only partial or insufficient censal data are available, we shall try to assess literacy as if given by full censal data.

There is a swathe of land in northern Europe, from the Netherlands to Sweden, including Great Britain, where literacy data obtained using modern statistical criteria and covering the whole population are not available, or they are available very late (as in Sweden)⁴. At any rate, we shall consider here three types of countries. Firstly, countries where we have census data for the whole country, sufficient for our purpose, although perhaps with some minor additional estimation work. Secondly, countries for which we have partial census data, but which allow us to make well-founded extrapolations. Thirdly, countries for which we have partial or late censal data that are insufficient, but which, supplemented with other additional data, allow us to draw reasonable conclusions.

We intend to study the development of the literacy process and when high literacy, indicated by the 75% of the population (over a certain age) threshold, was reached in each country.

Literacy is an abstract and general tool for the acquisition and communication of knowledge. Consequently, it expands the individual's decision-making capacity and scope of freedom. She who teaches literacy knows that the skills she is imparting can be used against her own ideas and expectations. Not for nothing did the President of the Royal Society in 1807 oppose (successfully) in the House of Lords a bill to provide elementary schools in England⁵: "... the project... of giving education to the labouring classes of the poor... would enable them to read seditious pamphlets, vicious books, and publications against Christianity; it would render them insolent to their superiors".

It must be considered when the data refer to literacy (ability to read and write) or semi-literacy (ability to read). In this paper we shall refer to literacy⁶. At any rate, certain forms of "restricted semi-literacy", in which the ability to "read" exclusively a limited set of *known* texts is acquired, although may be useful knowledge (or a mechanism of ideological control), fall short of the concept of literacy or semi-literacy as a general tool.

We conclude that there are four groups according to when the 75% literacy threshold is reached. The first group corresponds to countries where the threshold had been already reached at the beginning of the second industrial revolution, in the years 1871-1880. It

³ See UNESCO (1953) about problems arising in censal literacy data. Besides, when literacy is self-reported there are attendant issues of possible upward bias. A test was implemented in 1864 to check the accuracy of the literacy self-report of the conscripts in France, with the result that their statements were highly reliable (see Furet and Ozouf 1977).

⁴ This is not the place to answer some questions that naturally arise. Why did the UK government choose to provide us with literacy data for Ireland, but omitted doing the same for England, Wales and Scotland? Why did the Swedish government wait until 1930 to include literacy questions in the census?

⁵ Quoted in Cipolla (1969: 65-66).

⁶ The UNESCO proposed definition of literacy reads: "A person is considered *literate*, who can both read with understanding and write a short simple statement on his everyday life" (see UNESCO 1957; the proposal was made by a committee in 1951).

comprises the Austro-German bloc and some neighbouring areas strongly influenced by it. The second group surrounds the first group to the east and north, and includes the countries where the 75% level was reached before the First World War (the axis France-Great Britain belongs here). The third group corresponds to areas peripheral respect to the first group, where the 75% threshold was reached by the Second World War. The fourth group includes only the outermost Portugal.

The article is organized as follows. Section 2 introduces the four literacy groups. The composition of these groups is justified in Sections 3, 4 and 5. Section 6 provides some final remarks.

2. LITERACY GROUPS

We consider the following classification of countries in Western Europe⁷ as for the development of the literacy process from the mid-nineteenth century to the Second World War:

GROUP I. *Countries where the literacy rate reached 75% already by the period 1871-1880:* Germany, Austria, Czechia and Denmark.

GROUP II. *Countries where the 75% level was reached before the First World War:* Ireland, Belgium, France, Slovenia, Great Britain and Sweden.

GROUP III. *Countries where the 75% threshold was reached by the Second World War:* Spain, Finland, Italy.

GROUP IV. *Countries where the 75% threshold was reached after the Second World War:* Portugal.

We shall justify this classification in the following three sections, which correspond to three levels of the quality of available data.

3. LITERACY FROM COMPLETE CENSUAL DATA

3.1. Literacy from literacy censual data

Table 1 shows the literacy data of Western European countries for which “modern census” data exist in the nineteenth century. For each country and census⁸, three

⁷ Present-day countries will be considered, even when inaccuracies are inevitable because of alterations in borders and displacements of populations. For practical reasons, the British Islands will be divided into (the whole of) Ireland and Great Britain. Transleithania (see below) and Poland have not been examined, as the drastic changes of borders make data reconstruction very difficult.

⁸ After the *Compromise* (“*Ausgleich*”) of 1867, the Austrian Empire was transformed into the dual monarchy of Austria-Hungary, constituted by two parts, with their respective parliaments and governments: *Cisleithania* (the Austrian part) and *Transleithania* (lands of the “*Archiregnum Hungaricum*”). *Cisleithania* was divided into 16 *crown lands* (“*Kronländer*”), each one with its own land

percentages of literacy are indicated: for men and women, separated by a hyphen, and the overall percentage in the bottom row. Portugal is not included in this table, as only questions on semi-literacy (i.e., ability to read) were posed in the censuses.

Table 1. Literacy rates in Western Europe before WW1

	Ireland (≥5)	Spain (≥10)	Italy (≥12, ≥10)	Belgium (≥15)	France (≥6, ≥10)	Prussia (≥10)	Austria (≥6, ≥11)	Czechia (≥6, ≥11)	Slovenia (≥6, ≥11)	Finland (≥10, ≥15)
1841	37-18 28									
1851	41-25 33									
1860/61	49-34 41.3	38.9-11.2 24.8	30.4-14.0 22.2							
1866				59.1-51.6 55.4	61.5-49.9 55.7					
1871/72	54.7-44.3 49.4				63.4-53.2 58.3	89.2-83.6 86.3				
1877		43.5-17.9 30.3								
1880/81	62.6-56.1 59.3		45.6-27.5 36.5	71.5-64.1 67.8			82.7-77.0 79.8	88.0-79.6 83.6	39.9-28.8 34.1	16.2-10.2 13.1
1887		48.2-22.8 35.1								
1890/91	72.4-68.9 70.6			76.4-69.9 73.1			89.7-85.2 87.4	94.1-88.1 91.0	55.7-44.4 49.8	25.9-19.3 22.5
1900/01	80.3-78.5 79.4	52.7-30.5 41.2		82.9-78.0 80.4	86.5-80.6 83.5		93.1-90.3 91.7	96.4-92.9 94.6	72.7-65.0 68.7	41.1-36.5 38.8
1910/11	84.7-83.7 84.2	57.6-38.6 47.7		88.3-84.9 86.6	90.3-85.9 88.1		95.9-94.5 95.2	97.7-95.7 96.7	84.2-79.1 81.5	57.4-53.3 55.3

Sources and notes in the Appendix

From the data in Table 1, the German speaking countries (Prussia and Austria) and neighbouring Czechia belong to Group I. Ireland, Belgium, France and Slovenia⁹ are in Group II. From Table 1 and Table 2, Finland¹⁰ and Spain are in Group III.

parliament (“Landtag”). The data of present-day Austria, Czechia and Slovenia have been extracted from the census of Cisleithania, following the historical divisions of the time (there is no full correspondence between old and new borders).

⁹ The corresponding column in Table 1 gathers the data of Carniola and Gorizia & Gradisca, the two crown lands of Cisleithania with a Slovene-speaking majority. Literacy grew widespread there only as Slovene-speaking schools became available. In Carniola a small German-speaking minority (among an overwhelming Slovene-speaking majority) had controlled local politics, while in Gorizia & Gradisca the Italian-speaking minority (about one third of the population) had historically prevailed over the Slovene-speaking majority. In general, the creation of Slav-language schools in Cisleithania progressed throughout the 19th century (starting with the Czech ones), although it was only at the end of the Habsburg monarchy that sufficient levels were achieved; it should be noted that some parents with Slav mother tongue (especially Jewish parents) preferred their children to study in German-language schools. See Urbanitsch (2021).

¹⁰ Finland was part of the Kingdom of Sweden until 1809 and then became part of the Russian Empire until 1917 as the autonomous Grand Duchy of Finland. Note that Finland followed the Swedish model, based on home instruction of the ability to read *known texts*, with high *restricted semi-literacy* and low literacy until modern school systems were introduced (see below in the subsection on Sweden).

Table 2. Literacy rates in Finland and Spain, 1920-1940

	1920	1930	1940
Finland (≥15)	71.0-68.8 69.9	84.9-83.4 84.1	
Spain (≥10)	63.9-48.1 55.7	74.8-59.4 66.8	82.7-71.5 76.8

Sources and notes in the Appendix

Border alterations and (mainly ethnically based) population displacements are to be considered in interpreting Table 1. Thus, on the one hand, the extent to which the data for “Prussia” can be extrapolated to “Germany” is discussed in section 4. On the other hand, it is relevant to analyse the literacy rates of ethnic minorities in Austria, the Czech Republic and Prussia.

As for the crown lands of present-day Austria, while in the exclusively German-speaking crown lands, except in Salzburg, the literacy rates (1880 census, population aged 6 or over) were above the Prussian average (1871 census, population aged 10 or over), in Styria or Carinthia, with significant Slovene-speaking minorities (Styria 32.7%, Carinthia 29.7%), the rates were considerably lower (Styria 62.6%, Carinthia 52.9%). In Tyrol (which at that time included Trentino), with an important Italian-speaking minority (45.4%), the overall rate was 81.3%, whereas the rate for the German-speaking districts was 87.0%.

In contrast with Austria, in Czechia there was no significant difference between the literacy levels of Germanophones and Czech speakers¹¹, and the detailed censal data available show that this was the case at least since the mid-nineteenth century¹².

Politics banned any ethnic information in the 1871 Prussian census¹³. At any rate, some words must be said in favour of the perspicacity of the officials of the Prussian Statistical Office in the 1870s, whose head was none other than Ernst Engel. The following comment in an article presenting the results of the 1871 census for literacy and confession could be read in the official journal of the Prussian Statistical Office¹⁴: “The table, which contains all these data for each department and the like, shows that

¹¹ In Czechia (data of 1880), 35.9% of the population was Germanophone (37.2% in Bohemia, 29.4% in Moravia and 48.9% in Austrian Silesia).

¹² The 1910 Austrian (Cisleithanian) census provides literacy rates by language group, further disaggregated by age interval (which allows for backward projection of results). The literacy rate for males aged 61-70 was 91.9% for German-speakers and 93.8% for Czech-speakers, and for those over 70 the figures were 89.1% and 91.8%, respectively. For females aged 61-70 the rates were 87.3% for German-speakers and 85.1% for Czech-speakers, and for those over 70 the rates were 82.2% and 78.6%, respectively. In that census the overall male rates (population aged 11 or over) were 97.0% for German-speakers and 97.9% for Czech-speakers, and the female rate was 95.5% for both language groups.

¹³ In 1890, 10.1% of the Prussian population were Polish-speaking. About the discriminatory policies of the Prussian government against the Polish ethnic minority, see Deutscher Bundestag (2019) and Kerstin, Wohnsiedler and Wolf (2020).

¹⁴ Engel (1874: 150). The journal was edited (“redigirt” (sic) by the head of the Statistical Office. Besides, this article is signed with the initials “K. B.”.

although the Catholics in most parts of the country have less favourable figures than the Protestants, the size of the difference is mainly due to the greater proportion of Catholics in the Polish-speaking population”¹⁵. At that time, the Prussian Statistical Office had no reliable data on the mother tongue (or on the usual language) of the population. Language questions were introduced in a general Prussian census for the first time in 1861, but the results were unreliable, as the number of non-German speakers included only those who did not know German. The Ministry of Interior prohibited the posing of any question on language until the 1890 census¹⁶ (the year of Bismarck’s dismissal), despite the attempts of senior statisticians like Richard Böckh (see Labbé 2007). In fact, a swathe of land along the far east of the country (Prussia proper, Posen and Upper Silesia) had literacy rates below 75%, with a minimum of 57.1% in Bromberg. This area corresponded to the districts with a sizeable Polish-speaking minority (Prussia proper) or a Polish-speaking majority (Posen and Upper Silesia). The rest of the country had literacy rates above approximately 90%, except for part of Pomerania (83.3% in Köslin and 84.1% in Stralsund)¹⁷.

3.2. Literacy from semi-literacy censal data

The Portuguese censuses did not provide data on literacy, but only on semi-literacy. The same occurs with the Italian censuses, except in 1861 and 1881, in which both literacy and semi-literacy figures were given. The data appear in Table 3.

In contrast with France, the percentage of semi-illiterates (people who can read but not write) was small in Italy already in the 1860s¹⁸. The reader can adjust the Italian data of Table 3 slightly downwards to obtain an estimation of literacy¹⁹. A different question is to gauge the effect of some heterodox instructions to the enumerators in the censuses of 1921 and 1931, at loggerheads with the principle that censuses are to reflect what it is,

¹⁵ “Aus der Tabelle, welche all diese Daten für jeden Regierungsbezirk und dgl. enthält, geht hervor, dass zwar die Katholiken in den meisten Landestheilen ungünstigere Zahlen aufweisen, als die Protestanten, dass aber die Grösse der Differenz vorzugsweise durch den stärkeren Antheil der Katholiken an der polnisch redenden Bevölkerung veranlasst wird”.

¹⁶ The language census of 1890 is methodologically rigorous, despite some flaws (see Belzyt 1998 for a critical analysis, with proposed corrections disaggregated by department (Polish) or district (Danish)).

¹⁷ The correlation coefficient between the literacy rate (1871 census) and the proportion of the population having Polish as mother tongue (1890 census) is $\rho = -0.8622$ (we consider disaggregation by department and include Masurian and Kashubian speakers within Polish speakers). Using the 1890 and other linguistic data, Kerstin, Wohnsiedler and Wolf (2020) shows that Prussian literacy in 1871 is to a large extent explained by having Polish as mother tongue or not, whereas whether the individuals are Protestant or Catholic is not significant. A parsimonious model of literacy in Prussia where only ethnic (linguistic) and religious regressors are considered, with disaggregation by department and data of the censuses of 1871 and 1890, leads us to the same conclusion as Kerstin, Wohnsiedler and Wolf (2020).

¹⁸ In Italy the percentage of semi-illiterates in 1861 was 3.9% for men, 5.5% for women and 4.7% overall. In France the figures in 1866 were 9.7% for men, 13.2% for women and 11.5% overall.

¹⁹ The Italian percentage of semi-illiterates in 1881 was 1.2% for men, 3.4% for women and 2.3% overall. These data are approximately one percentage point inferior to the Spanish ones of 1887. As guidance for the adjustment of the Italian figures of Table 3, the Spanish data of semi-illiteracy are available until 1930: in 1900 they were 1.6% for men, 3.4% for women and 2.6% overall, and in 1930 they were 0.4% for men, 1.1% for women and 0.8% overall.

and not what it should be²⁰. The Italian census of 1941 was never carried out, but we may place Italy in Group III.

In the case of Portugal, we have no censal reference to estimate the percentage of semi-illiterates. In any case, as the literacy rate is less than or equal to the semi-literacy rate, Portugal belongs to Group IV²¹.

Table 3. Semi-literacy rates in Italy and Portugal, 1900-1940

	1900/01	1911	1920/21	1930/31	1940
Italy (≥10)	58.3-45.4 51.8	68.4-57.5 62.8	76.7-70.0 73.2	82.2-74.8 78.4	
Portugal (≥10)	36.1-18.2 26.6	40.4-23.0 31.1	43.6-27.2 34.8	49.6-31.1 39.8	58.5-41.5 49.6

Sources in the Appendix

4. LITERACY FROM PARTIAL CENSUAL DATA

4.1. German literacy from Prussian censal data

The literacy data of the 1871 Prussian census were a sensation among the European élites. Many found them scary also: that very same year the German Reich had been founded, after the military defeat of France.

In fact, 62.4% of the population of the new Germany (1871 census, excluding the annexed Alsace-Lorraine) corresponded to the Kingdom of Prussia. Besides, the Prussian literacy data of 1871 were not particularly Prussian, but German, as we shall argue now, and therefore “Prussia” can be replaced by “Germany” in Group I.

In 1866, after the Austro-Prussian War, Prussia incorporated territories of several German states, increasing 21.8% its population²². The expansion of the kingdom of Prussia permits obtaining, in its 1871 census, literacy data of territories in which the level of literacy achieved was not attributable to the action of the Prussian authorities. After 1850 we have the following five groups of annexations:

²⁰ All children registered in a school were to be automatically considered literate, even those six years old, with the argument (see the Italian census of 1931, Vol. IV, p. *95) that “at the date of the census, i.e. at the end of April, those enrolled in the first elementary class should, on the basis of the school programmes, already know the entire alphabet and therefore be able to read a printed text” (“gli iscritti alla prima classe elementare, alla data del censimento, cioè alla fine di aprile, dovevano, in base ai programmi scolastici, conoscere già tutto l’alfabeto ed essere in grado, quindi, di leggere uno stampato”). This criterion was implemented in the census of 1931, and to some extent (perhaps) in that of 1921 (see *ibid.*): “in 1921, during the counting, the cited conventional norm of considering *all* schoolchildren literate could not be rigorously applied” (“nel 1921, durante gli spogli, non poté essere applicata rigorosamente la citata norma convenzionale di considerare alfabeti *tutti* gli scolari”).

²¹ The Portuguese rate was 74% in the 1970 census and 79% in the following census, in 1981 (see Candeias 2004).

²² Data as of 1867 (see the Prussian census of 1871, p. 6-7).

(1) *Hohenzollern-Sigmaringen* and *Hohenzollern-Hechingen*. In 1850, after the abdication of their respective princes, the principalities of Hohenzollern-Sigmaringen and Hohenzollern-Hechingen were incorporated into Prussia, becoming the department (*Regierungsbezirk*²³) of Sigmaringen²⁴.

(2) *Schleswig* and *Holstein*. After the Second Schleswig War (1864), the Duchies of Schleswig, Holstein and Lauenburg (until then held by the Danish monarch in personal union) were ceded to Prussia and Austria. In 1866 Prussia assumed control of the three territories, which were eventually integrated into the department of Schleswig²⁵.

(3) *Hanover*, *Hesse-Kassel*, *Nassau* and *Frankfurt*. Annexed in 1866. The Kingdom of Hanover became the province of Hannover, divided into six departments. The Electorate of Hesse (Hesse-Kassel) turned into the department of Kassel, the Duchy of Nassau and the Free City of Frankfurt became the department of Wiesbaden.

(4) *Some territories of Hesse-Darmstadt*. The Duchy of Hesse (Hesse-Darmstadt) had to cede the districts (*Kreise*²⁶) of Biedenkopf and Vöhl to Prussia in 1866, which were incorporated into the departments of Wiesbaden and Kassel, respectively²⁷.

(5) *Some territories of Bavaria*. Apart from a tiny exclave, the Kingdom of Bavaria ceded to Prussia in 1866 the districts of Gersfeld and Orb²⁸. Both were included in the department of Kassel.

The North German Confederation was created in August 1866. The new Prussia enlarged by the annexations made up roughly 80% of the population of the Confederation. Against the background of the Prussian global literacy rate, 86.3% in the 1871 census, it is worth considering the literacy rates in that census of the nine new departments formed with the annexations of Prussia in 1866, corresponding to territories of its enemies in the Austro-Prussian War: Schleswig, 95.1; Hannover, 94.3%; Hildesheim, 89.3; Lüneburg, 93.5%; Stade, 92.2%; Osnabrück, 94.8%; Aurich, 91.1%; Kassel, 92.5%; Wiesbaden, 97.2%.

²³ We translate “Regierungsbezirk” by “department”. There were 36 Regierungsbezirke in Prussia in 1871; they were comparable in size to French “départements” (admittedly, the population of a Regierungsbezirk was on average greater by approximately one third than that of a département).

²⁴ Despite the twenty years elapsed until the census, the very high literacy rate (97.2%, the highest of all departments, except for the capital Berlin) imply that literacy was widespread at all ages in 1871 and thus that literacy levels were already high before the incorporation into Prussia.

²⁵ The Duchy of Lauenburg was not incorporated formally into the Kingdom of Prussia until 1876, and thus its results were not included in the 1871 Prussian census. Lauenburg was small (47,347 inhabitants in 1871).

²⁶ We translate “Kreis” by “district”. Districts could consist of a large enough municipality (“Stadtkreise”) or of several municipalities. During industrialisation and the concomitant process of urban growth, the number of Stadtkreise grew steadily.

²⁷ Besides, in 1866 the Grand Duchy of Hesse inherited the Landgraviate of Hesse-Homburg (27,563 inhabitants in 1865), but had to cede its territory to Prussia later that year, and then it was divided between the departments of Koblenz and Wiesbaden.

²⁸ Gersfeld was a “Bezirksamt”, the Bavarian equivalent of a Prussian “Kreis”, and Orb was part of the Bezirksamt of Gemünden.

The south German states of Hesse-Darmstadt²⁹, Bavaria, Württemberg and Baden did not enter the North German Confederation. From the Prussian census of 1871, the literacy of the (reputedly poor) territories (Biedenkopf and Vöhl) just annexed from Hesse-Darmstadt can be obtained: 92.9%; the literacy rate of the territories (Gersfeld and Orb) annexed from Bavaria was 94.4%. As for Württemberg and Baden, the Prussian data of the annexed, rural Sigmaringen, a narrow strip of land sandwiched between them, are to be considered: 97.2% literacy rate.

4.2. Danish literacy from Prussian censual data

In the section on international comparisons of the Italian census of 1881, a letter from the Italian Statistical Office to its Danish counterpart is mentioned, as it is the reply from its director:

“The Director of Statistics of Denmark has written to us that, since education is compulsory for children from 7 to 14 years of age, at this last age everyone must produce the certificate of knowing how to read and write. However, this does not prevent there being illiterates, since there are those who have forgotten what they learned in compulsory schools, which are very few, after all, and the idiots (sic) who have not been able to obtain the aforementioned certificate”.³⁰

There is support for this qualitative statement through census data, albeit only for a part of the population. As mentioned above, after the Second Schleswig War (1864), Prussia acquired in 1866 (after a brief period of shared sovereignty with Austria) the Duchies of Schleswig, Holstein and Saxe-Lauenburg, formerly under the sovereignty of the King of Denmark. Thereby the total population of the Danish monarchy decreased by 38.5%. The data of Schleswig-Holstein appeared in the Prussian census of 1871, and its literacy level was among the highest in Prussia: 95.1%.

The Duchy of Holstein was German-speaking and part of the Holy Roman Empire, although since 1773 its sovereign was the King of Denmark. The Duchy of Schleswig had been under the sole sovereignty of the King of Denmark since 1713, and contained German-speaking and Danish-speaking areas. Danish-language speakers were concentrated in northern Schleswig, in the districts of Hadersleben, Sonderburg and Apenrade, and in part of the district of Tondern³¹. All these areas showed high literacy

²⁹ The part of Hesse-Darmstadt north of the river Main was forced into the North German Confederation from the start.

³⁰ “Il direttore della statistica della Danimarca ci ha scritto che, essendovi colà l'obbligo della istruzione pei fanciulli da 7 a 14 anni, a tale ultima età ognuno deve produrre il certificato di saper leggere e scrivere. Ciò però non impedisce che vi siano degli analfabeti, poichè vi sono quelli che hanno dimenticato ciò che appresero nelle scuole obbligatorie, i quali del resto sono pochissimi, e gli idioti i quali non hanno potuto procurarsi il suddetto certificato”. (Italian census of 1881, Relazione generale, p. 136).

³¹ In the 1890 Prussian census the proportion of Danish speakers was between 80% and 90% in the first three districts and around 50% in Tondern.

figures in the Prussian census of 1871: Hadersleben, 94.0; Sonderburg, 97.0; Apenrade, 96.4; Tondern, 96.1.

In contrast to the Scandinavian countries, Denmark had established a school network broadly covering the country by the middle of the nineteenth century³². The laws of 1814 prescribed compulsory schooling for seven years, including reading, writing and arithmetic (see Larsen 2017). In this sense, a statistical study of soldiers in 1859 indicated that 88.3% of them could read and write³³. All in all, it is reasonable to assign Denmark to Group I.

5. LITERACY FROM INSUFFICIENT CENSUAL DATA

In the last two remaining subsections, on Great Britain and Sweden, censual data are inadequate, and additional data have to be assessed taking censual data as a yardstick.

5.1. Great Britain

It is remarkable that, in contrast with Ireland, there are no censual literacy data for Great Britain (England and Wales, and Scotland)³⁴. Apart from the indirect information that can be obtained from Irish censuses, in the case of Great Britain we only have literacy data (mainly about signatures in documents) typical of the age prior to the development of modern official statistics.

The Irish 1871 census provides some hints on the literacy situation in contemporary Great Britain, especially if attention is paid to the Protestant minority³⁵ (which interacted significantly with England or Scotland). Almost all Protestants were either Episcopalians (12.34% of the population) or Presbyterians (9.19%). Presbyterians were in general of Scottish descent and aware of their roots; 96% of them lived in the province of Ulster, with Scotland just across the North Channel. Their literacy rates were 73.9% for men, 63.4% for women and 68.5% overall³⁶. Episcopalians constituted

³² “The main reason for the Danish decision to introduce elementary education through a compulsory school system may have been the close cultural relations to Germany.” (Tveit 1991).

³³ See Markussen (1990). The Danish constitution of 1849 stated that all men had to report for military service.

³⁴ Following the merger of the parliaments of Scotland (1707) and Ireland (1801) with the Parliament of Westminster, the British Isles were under the authority of a single parliament. This situation was maintained until the Government of Ireland Act (1920) and the Anglo-Irish Treaty (1921), leading to the independence of Ireland (except Ulster).

³⁵ In 1871, 76.69% of the Irish population were Catholics, dispossessed of their land and economically, socially and politically oppressed; their literacy rates were 48.8% for men, 37.9% for women and 43.2% overall.

³⁶ In contrast with Ireland, the Presbyterian Church was the established church in Scotland, and it had there its own school system funded by a tax charged on landed property (beginning in 1696); industrialization and a more diverse society (especially after the 1843 Disruption) made this system increasingly inadequate (see Anderson 1983). The creation of a Scottish national system of elementary education only would take place by the Education (Scotland) Act 1872. On the other hand, in 1831 a

the established church in both England (“Church of England”) and Ireland (“Church of Ireland”), but their small number in Ireland made a difference³⁷. The core of the Episcopalians in Ireland exerted “the Ascendancy”, i.e., the domination of the economy and the social and political life of the country³⁸. The literacy rates for Irish Episcopalians were 72.8% for men, 65.3% for women and 69.0% overall.

From 1839 for England and Wales and from 1855 for Scotland, aggregate statistics on whether spouses signed with their names or just made a mark on the marriage document were published. These data have the limitation (see above) of any signature-based evidence for assessing literacy. Certainly, the data come in the case of marriages from a large population group in which both sexes are equally represented, although there is a strong age bias. On the other hand, in France both census literacy data (in 1866 and 1872, and then from 1900) and marriage signatures data (from 1854) are available. Moreover, the marriage signatures data are not far apart in the two countries: for men the percentage of marriages with (proper) signature is always higher for England and Wales, but the difference is less than or equal to 4 points in all years of the period 1854-1880 (with only two exceptions), and the average difference is 3.3 percentage points; for women the percentage of marriages with signature is also always higher for England and Wales, and the difference is rather stable and not very large in the period 1854-1880 (between 7 and 9 points in all years, with only five exceptions), with an average difference of 8.1 percentage points³⁹; therefore the average overall difference between England & Wales and France in the period 1854-1880 is 5.7 points. Looking at the parallelism and relative proximity of the series on marriage signatures in the two countries, it suggests itself to take advantage of the relationship between census literacy data and marriage signatures data in France to estimate what the census data in Britain would have been like. In 1872 the percentage of spouses able to write a signature at marriage in France is 71% (77% for bridegrooms, 65% for brides), while the overall literacy rate in the census is 58.3%. The reduction coefficient is $0.82=58.3/71$, attributable to the age bias of marriage data and to the general fact that signature-based figures overstate literacy. Since in 1872 the percentage of spouses able to write a signature at marriage in England & Wales is 77.5% (81% for bridegrooms, 74% for brides), a crude estimate of censal literacy is 63.5% ($63.5=0.82 \cdot 77.5$). As for Scotland, in 1872 the percentage of spouses able to write a signature at marriage is 84.5% (90% for bridegrooms, 79% for brides), and a parallel (now riskier) estimate of censal

national school system was created in Ireland which financed schools that were, in practice, denominational; in 1839 the Irish Presbyterian Church entered the system on very favourable terms.

³⁷ The Church of Ireland maintained its own network of schools and was the established church in Ireland until 1869 (funded by taxation on the entire population and contributions of wealthy members). From 1869 most of its schools were progressively integrated into the national system introduced in 1831. The funding of the Irish Episcopalian elementary education (before 1869) had parallels with that existing in England for Anglicans prior to the 1870 Act, although the character of small privileged group of the Church of Ireland is not exactly applicable to the Church of England.

³⁸ Although more than half of Episcopalians lived in Ulster (58.87%), they were more spread about Ireland than Presbyterians.

³⁹ See Flora (1983, p. 81-83). The years 1870 and 1871 have not been considered (Franco-Prussian War). In the period 1881-1900 the differences between England & Wales and France were smaller.

literacy is 69.3% ($69.3=0.82 \cdot 84.5$). Considering the relative weights of the populations of England & Wales and Scotland⁴⁰, the resulting estimate of the censal literacy rate of Great Britain in 1872 is 64.2%.

All in all, we can conclude that the male literacy rates of France and Great Britain were similar in the 1870s, although the gender gap was larger in France, with the result of a higher overall literacy in Great Britain, but moderately so (around 6 percentage points in 1872). On the other hand, literacy in Great Britain at the time was much lower than in Germany (the difference might be between 22 and 24 percentage points in 1872). We may place Great Britain in Group II.

5.2. Sweden

Before the implementation of the School Act of 1842, the Swedish elementary education model was based on home instruction of the ability to read *known texts*: a set of selected religious texts, where submission to authority was emphasized (see Tveit 1991 and Nilsson and Pettersson 2008). This model was within the Weltanschauung of “the world of the Hustavla”⁴¹, in the words of Johansson (1977). Practically all Swedes could “read” in this very restricted way already by the end of the 18th century. The result was high *restricted semi-literacy* and low literacy.

The only Swedish census with literacy data was too late: in 1930 (showing less than 1% illiteracy). On the other hand, there are literacy data of conscripts only from 1875 (every five years). As a compensation for this paucity of statistical data, there is a remarkable sample of individual literacy assessments carried out by the parish pastors in the diocese of Lund, recorded from 1813 to the middle of the 1840s (see Nielsen and Svärd 1994)⁴²; the resulting literacy rate (population aged 15 or over) is 10% (18.7% for men and 1.4% for women)⁴³. Considering the imperfections of the Lund data, Nielsen and Svärd (1994) presents their estimate for the literacy rate as an interval, whose upper bound is 20%.

⁴⁰ In the 1871 census the population of Great Britain is 26,072,284, including 3,360,018 of Scotland (12.89%).

⁴¹ “The *Hustavla*, (a religious plaque which was hung on the wall), was a supplement to Luther’s *Small Catechism*. It consisted of specific Bible verses arranged according to the traditional, Lutheran doctrine of a three-stage, social hierarchy – *ecclesia* (church), *politia* (state), and *oeconomia* (home or household). These selections of Scripture outlined the Christian duties and obligations which each stage in this hierarchy owed to the others” (Johansson 1977). “Hustavla” is the Swedish translation of the German term used by Luther (“Haustafel”, meaning “house board”).

⁴² It is to be considered, on the one hand, that the Lund diocese had a much higher density of schools than the rest of the country: almost half of the permanent schools in Sweden were in Lund, where only 9% of the parishes lacked schools already in 1839 (see Westberg 2019). On the other hand, the pastors were perhaps demanding (in order to mark a person down as literate) more than the literacy level resulting from a censal declaration.

⁴³ The writing ability of Swedish women before the application of the 1842 Act was very low. At any rate, Nielsen and Svärd (1994) suspects that women’s writing ability was underreported in the Lund research, and guesses (based on limited school data) that the women's writing rate was one-fifth of the men's writing rate, i.e. 3.7%. Thus the overall rate would change slightly to 11.1%.

The 1842 Act imposed the creation of schools in all parishes, where the teaching of proper reading, writing and elementary arithmetic was made mandatory. The new school system was established rather fast, and literacy increased sharply among the new generations⁴⁴. However, the older generations would not decide to die quickly just to improve the literacy rates of the country, and they would last as many years as apportioned to them. We can estimate, despite the deficiencies in data, that the low male literacy and very low female literacy before the implementation of the 1842 Act did not allow Sweden to go beyond the 75% threshold during the 1870s. In order to assess the Swedish literacy in 1880, the age structure of the population is to be considered (see Statistiska Centralbyrån 1969). In Table 4, the literacy rate for those born until 1830 is estimated through the mentioned sample in the diocese of Lund, and for those born in the intervals 1851-1860 and 1861-1865 is assessed by the literacy rates of conscripts (male by definition)⁴⁵. The estimates for the intervals 1831-1840 and 1841-1850 are obtained by interpolation⁴⁶. The estimate of the overall literacy rate (population aged 15 or over) in 1880 is 54.9%. If the upper bound of 20% literacy for the Lund data were applied to the first interval (20% instead of 10%), and linear interpolation for the two following intervals were also implemented, the resulting rate would be 59.4%, still well below the 75% threshold⁴⁷. Following an analogous procedure, the estimated literacy rate for 1910 is approximately 90%⁴⁸. With the statistical evidence available, it seems appropriate to assign Sweden to Group II.

Table 4. Cohorts and literacy in Sweden, 1880

	Born until 1830	Born 1831-1840	Born 1841-1850	Born 1851-1860	Born 1861-1865	All
Percentage of the population (≥ 15)	27.9	15.9	18.2	23.3	14.7	100
Literacy rate	10.0	36.3	62.7	89.0	96.5	54.9

⁴⁴ The number of teachers grew from approximately 1,500 in 1839 to 2,785 in 1847 and 3,458 in 1850 (see Westberg 2019).

⁴⁵ See Flora (1983, p. 81-82). We use the 1875 rate for those born in 1851-1860 and the average of the rates of 1880 and 1885 for the interval 1861-1865.

⁴⁶ The literacy rates 10.0 and 89.0 are assigned to the years 1825 and 1855, respectively. Then the values for the years 1835 (representing the interval 1831-1840) and 1845 (representing the interval 1841-1850) are calculated by linear interpolation.

⁴⁷ Note to what extent these estimates rely on two hypotheses: (1) the percentage of those who learned to read and write only after the age of 15 (or 20 from 1851) is low; (2) the abysmal gender gap before the 1842 Act closed very fast and existed no longer in the 1851-1860 interval.

⁴⁸ The exact value depends on the literacy estimate for those born until 1830. The literacy rates of conscripts are used to assess the literacy rates of those born after 1850. Indeed, the size of the cohorts not having benefited from the full implementation of the 1842 Act had tapered off substantially by 1910: among the population aged 15 or over, 7.89% were born until 1840 and 9.61% in 1841-1850 (see Statistiska Centralbyrån 1969).

6. FINAL REMARKS

It is not the purpose of this article to establish an explanatory model, but to facilitate comparability of data. At any rate, any analysis has to take idiosyncratic factors into account, as illustrated by the top literacy cluster. Group I does not correspond to the most economically advanced countries on the eve of the second industrial revolution. After the first industrial revolution, only Great Britain and Belgium were industrialised countries. The importance of cultural factors must be taken into account. In the German cultural sphere, ideas and experiences, going beyond denominational divisions⁴⁹, were shared, particularly, but not only, among the élites. In this sense, religious movements such as Pietism⁵⁰ or reform Catholicism⁵¹ favoured universal literacy. Some features of the process leading to mass literacy in the German cultural sphere are the following: (1) an early start, taking place already at the end of the eighteenth century; (2) state laws made elementary education compulsory⁵² (as in Prussia⁵³ or Austria⁵⁴); (3) the control of the schools was to a large extent in the hands of the churches (with the supervision of the state), whose personal (and, to some degree, financial) resources were used; (4) elementary education was fostered equally for boys and girls from the beginning (and consequently a low gender gap resulted).

⁴⁹ In the corresponding territory of the Holy Roman Empire of the German Nation (Germany and part of Cisleithania) there were 28,674,355 Protestants and 29,639,008 Catholics in 1880. In Denmark there were 1,958,678 Protestants and 2,985 Catholics in the same year. On the other hand, within the Protestant camp, the effect of the division between Lutheranism and Calvinism was limited. From 1817, a series of decrees by King Frederick William III disposed the unification of the Reformed and Lutheran congregations into one "united" church in Prussia. The king acted in his capacity as *summus episcopus* of all these churches, sometimes rather heavy-handedly: the Lutheran Church-Missouri Synod was formed by dissenting Lutherans emigrated to the United States. The protestant churches of the territoires annexed in 1866 were allowed to remain independent, but the king of Prussia replaced the former princes as *summus episcopus*, following the "landesherrliche Kirchenregiment" (i.e. the governing power of the holder of territorial power over Protestant churches), characteristic (not only) of German Protestantism.

⁵⁰ See Gawthrop and Strauss (1984). As for Denmark, see Tveit (1991).

⁵¹ "Reform Catholicism ... occupied a position within Austrian Catholicism closely analogous to that of the Pietist movement in the Lutheran Church ... In their advocacy of lay Bible reading, both prepared the ground for the promotion of compulsory schooling in their respective states." (Melton 1988). Certainly, reform Catholicism was not particularly Austrian, and its main reference was pope Benedict XIV.

⁵² "...the German cultural sphere, of which Austria was a part, relied on state force in education from the start whereas other West-European countries made schooling compulsory by and large only at later stages." (Cvrček 2020).

⁵³ The Prussian Generallandschulreglements for Protestant schools (1763) and for Catholic schools (1765) were advanced for their time, but poorly enforced. Mass literacy was reached in Prussia under the Allgemeines Landrecht (1794), which established compulsory education: "Every inhabitant who is unable or unwilling to provide the necessary education for his children in his home is obliged to send them to school after they have completed their fifth year." ("Jeder Einwohner, welcher den nöthigen Unterricht für seine Kinder in seinem Hause nicht besorgen kann oder will, ist schuldig, dieselben nach zurückgelegtem fünften Jahre zur Schule zu schicken".)

⁵⁴ The Allgemeine Schulordnung (1774) of Empress Maria Theresa (drawn up by the Silesian abbot Johann Ignaz von Felbiger) established compulsory elementary education (there was a different regulation for the lands of the Archiregnum Hungaricum, the Ratio educationis (1777), where this compulsory character was watered down). Mass literacy was reached in Austria (proper) and Czechia under the Allgemeine Schulordnung and its modified version, the Politische Schulverfassung (1805). Beyond that, the new Cisleithanian parliament created after the Ausgleich of 1867 passed in 1869 the elementary education law that was to be in force until the end of the Habsburg monarchy.

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APPENDIX

Sources for Table 1, Table 2 and Table 3

Ireland: Censuses of 1841, 1851, 1861, 1871, 1881, 1891, 1901 and 1911. Spain: Censuses of 1860, 1877, 1887, 1900, 1910, 1920, 1930 and 1940, Gutiérrez and Quiroga (2023). Italy: Censuses of 1861 and 1881, UNESCO (1953). Belgium: Censuses of 1866, 1880, 1890 and 1900, UNESCO (1953). France: Censuses of 1866 and 1872, UNESCO (1953). Prussia: Census of 1871. Austria (Cisleithania): Censuses of 1880, 1890, 1900 and 1910. Finland: Myllyntaus (1990). Portugal: UNESCO (1953).

Notes to Table 1 and Table 2

In the data of Spain (1860-1930) and Prussia (1871), individuals who do not state their level of literacy are considered illiterate.

The total literacy rate for the population aged 9 or over in Ireland is 87.6 in 1911.

The adjustment of the data of the 1860 and 1877 Spanish censuses to the population aged 10 or over has been estimated in Gutiérrez and Quiroga (2023).

The figures from the 1861 census in Italy are for the population aged 12 or over, and those from the 1881 census for the population aged 10 or over. In the censuses of 1871, 1901, 1911, 1921 and 1931 there are only data on semi-literacy (in 1891 no census was carried out). The Italian data for 1861 do not include Lazio and Veneto, but from the 1871 census results it can be supposed that the inclusion of these two regions would do little to alter the global data of 1861.

The data from the 1866 and 1872 censuses in France are for the population aged 6 or over, and those from the 1901 and 1911 censuses for the population aged 10 or over.

The 1880 census in Austria (Cisleithania) provided literacy data without considering ages. As the literate population under the age of six is small, and the population aged 6 or over is known, the raw literacy data obtained dividing the literate population by the population aged 6 or over have been taken here to approximate literacy rates for the population aged 6 or over, as was done retrospectively in the "Introduction" of the 1890 census (Heft 1, pp. XXI-XXVI; there is a minor mistake in the calculation of the female literacy rate of Styria). The figures from the 1890, 1900 and 1910 censuses are for the population aged 11 or over.

Data from the 1880 and 1890 censuses in Finland are for the population aged 10 or over, and those from the 1900-1930 censuses for the population aged 15 or over.