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## Sibling Struggle for Schooling: Between Resource Dilution and Collaborative Learning, the Netherlands, 1850-1920

*Mattijs Vandezande, Koen Matthijs & Jan Kok\**

**Abstract:** »*Geschwisterkampf um Schulbildung: Zwischen Ressourcenminderung und gemeinschaftlichem Lernen: die Niederlande 1850-1920*«. During the 19th century illiteracy in the Netherlands declined to the level of almost non-existence. Much attention has already been paid how a child's life circumstances affect his or her ability to write. Most research does not go beyond the household or aggregate level. This study aims to explore differences in literacy within a household. Following the resource dilution hypothesis, we expected literacy to be much higher among sons (than among daughters) and among (young) children from large families (as opposed to smaller families). Indeed, more boys are literate than girls, and especially in large families the oldest children are advantaged. However, we found the gender and higher birth order discrimination to be compensated with a mechanism where older girls seem to help their younger sisters, but not their younger brothers. We therefore believe gender specific mechanisms are at work which can explain literacy variations within a household.

**Keywords:** historical demography, illiteracy, sibling composition, resource dilution model, gender differences.

Tijmen van der Kooij (1875-1957), son of a Frisian shopkeeper who later became well-known as a Protestant schoolteacher, wrote in his autobiography that in his youth he could not attend school due to his poor health. Yet he was not bereft of education: "(...) I learned a lot at home, unintentionally – 'occasional' we called it later – from my parents, my schoolgoing brothers, indeed anyone who gave anything away." (Van der Kooij and van Tuinen 1993: 3; own translation). Tijmen was no exception, not everyone in the nineteenth century was attending school on a regular basis (for 1892, the proportion of Dutch pupils not finishing primary school is estimated at one in eight, Boekholt 1985: 214). Yet almost all children got some education, mostly at school, sometimes pri-

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vately (van der Woude 1980; Boonstra 2008: 133-134). Literacy, “one of the cornerstones of the ‘modern’ world”, rapidly became a social norm and a prime factor for social mobility (Donald 1983). This process was driven and supported by generally accepted values (a general international comparative, but somewhat outdated, overview is Cipolla 1969). It had all sorts of social, cultural and demographic implications, including the reduction of infant and child mortality (Boonstra 1998), control of fertility (Boonstra and van der Woude 1984; Boonstra 1998), the increased openness of marriage and partner selection (Hoyler 1998), and the evolution to a meritocracy (which means that status attainment is more and more driven through someone’s own merits, Boonstra 1993; Boonstra 2008; Zijdemans and Mandemakers, 2008). In the unfolding of this modernization process literates behaved differently than illiterates (Boonstra 1995: 79-80; Matthijs 2001: 80-83, 197-198).

### The Setting: Literacy in the Netherlands

The spread of literacy in the Netherlands was not always and everywhere the same, there were temporal, categorical and regional differences (Vincent 2000). In the southern provinces – Limburg, North Brabant, Zeeland – the rise of literacy was later and slower (Boonstra 2009) than in other regions. Based on a study of nineteenth-century Eindhoven, Boonstra (1993) came to the following conclusions: women were less literate than men, rural residents less than city dwellers, Catholics less than non-Catholics (mostly Protestants and Jews) (see also Knippenberg 1986: 82-84). According to Boonstra, the latter was not only due to reading skills required by Protestants and Jews, but probably also to the fact that the Protestants and Jews of Eindhoven (who were often newcomers) had a higher occupational status. Educational opportunities for children were closely related to the status and occupation of the father and his literacy. Boonstra’s later research (1995) showed that these findings also apply to the province of Utrecht, although there the literacy process started earlier and evolved more rapidly.

### Households and Siblings

During the last two decades, the historical-demographic research on household characteristics received a new and refreshing impulse in the form of increased attention to micro-sociological family interactions: the birth order of children, the brother-sister system (besides the parental and the marital system), the sibling configuration, and other internal family characteristics (e.g. Janssens 1993; Kemkes 2006; Bras, Kok and Mandemakers 2010). This was partly the result of in-depth, individual-level research on the causes and consequences of the demographic transition. Those analyses showed that the transition had

major effects on the household composition, the relationship between brothers and sisters, and the sibling structure.

The next challenging question is whether that also had an effect on the educational opportunities of children. Studying the interconnections between the sibling set and literacy is of interest because of the recent debate on the question whether investments in 'human capital' explain both (rapid) economic development and the fertility decline (for an overview, see Alter and Clark 2010). A crucial element of the relation between economic and demographic developments is the 'quality-quantity trade-off': parents began to invest in (a smaller number of) high quality children, because of the rising demand for human capital in the phase when economic growth was accelerating (Galor 2005). Parents may have seen opportunities for social advancement for their children, through education, inducing them to lower their family size (Van Bavel 2006). Therefore, we can assume a positive connection between smaller families and literacy. Gender differences may play a role here as well. Generally, the stronger the gender differences in a given society, the slower a transition to smaller families would occur. Without gender equity, parents will aim to have a large number of children, and invest only in the education of their sons (Mason 2001). In other words: gender stratification tends to block the quality-quantity trade-off. So the question is: is there a connection between smaller families, more education, and more equal access to education between the sexes? These issues have hardly been explored at a micro-level. An exception is a Swiss study showing that growing interest in education for girls (which was diversified along religious lines) affected family size in the 19th century (Praz 2007).

In the study of literacy and education most attention has been devoted to the (early) life conditions of the individual children. More specifically it consisted of analyses of environmental factors (such as the availability of education and means of transportation) and household characteristics (such as occupational status of the parents and religious denomination). These features have a similar effect on all household members, or at least to some extent. This is not the case for internal family characteristics, such as birth order, and the total number of children. The oldest of five grows up in a different learning environment than the youngest, and the oldest of two brothers lives in a family context other than the youngest of two girls does.

Internal family characteristics and associated micro-sociological dynamics were hitherto neglected in research on the diffusion of literacy. This has a pragmatic reason: investigation into micro-effects requires micro-data, which are not readily available. Moreover, although attention to these effects was not non-existent, it was very marginal. A good example is a prospective study by Levine (1979), which used signatures on marriage certificates from parish registers. He investigated whether birth order in the period 1754-1851 had an effect on the literacy of 334 men and 393 women in the English village of

Shephard. He could find no correlation, which possibly played an inhibitory role in the further exploration of a nonetheless pertinent research question. This is a pity, especially since Levine's conclusion was probably somewhat rash; some methodological questions can be raised with respect to his research design and approach. Levine only focused on marriage records, which in his family reconstruction led to an underestimation of the birth order. By reconstructing families from marriage records, he excluded the non-marrying brothers and sisters, and those who died young, from his study. In our view, this family reconstruction method does not accurately reflect the family context of the research subjects in their youth, and that context was of course very important.

There is an extensive amount of research on the effect of (contemporary) family characteristics (size, sibling structure) on the educational opportunities of children (an overview can be found in Steelman et al. 2002). It mostly focuses on the so-called resource dilution model, a term first used by Blake (1981; also see Downey 1995). A premise of this model is that the financial, emotional and other resources available to parents for their children are limited. Therefore all resources have to be spread – hence 'diluted' – over their children. Other factors remaining constant, the larger the family, the less resources a child gets. This is even more so for younger children than for older ones. The latter would benefit from their (higher) position in the family: first come, first served (Modin 2002; Black, Devereux and Salvanes 2005). It can be hypothesized that this model also works in historical populations.

The purpose of our research is to determine whether the resource dilution model applies to the diffusion of literacy in the nineteenth-century Netherlands as well. It examines whether the presence of siblings had an effect on literacy. We expect that children with many siblings saw their opportunities for schooling decrease. We hypothesize that this effect is stronger for high-parity children. Furthermore, we venture into uncharted waters by trying to establish relations between the composition of the siblings set and individual literacy. To what extent were older brothers and sister willing and able to assist their younger siblings in learning to write? If we do find traces of such *collaborative learning* (term from Gregory 2001), it would run counter the resource dilution model.

## Data and Method

By default, the degree of literacy in historical demographic research is often measured by the presence of a signature on the marriage certificate. Although its validity has to be carefully examined (Schofield 1973: 440-443; Boonstra 1993: 103-108; Hoyler 1998: 203-204), this indicator is assumed to give a

fairly good picture of the long-term evolution of writing, even if it is a crude measurement that only pertains to married people<sup>1</sup>. The absence of a signature is always explained ('person is not present', 'person is not able to write'). The advantage of this approach is that the presence of signatures can be related to other information from the marriage certificate. This in turn can be further supplemented with information from birth certificates (of the observed individual, but also his or her parents) and from the population registers.

This study uses data from the Historical Sample of the Netherlands (HSN)<sup>2</sup>. The HSN database consists of a random sample of "research persons" born in the period 1812-1922. The sample was taken from the birth certificates (0,5%). The research persons were followed through their life course in sources such as the civil registration records (birth, marriage and death certificates) and the population register (Mandemakers 2001; 2006). The HSN release of 2008, which is used in this study, is split into two parts: one containing information on individuals born before 1883, and one for research persons born from 1883 onwards. Because almost all people born in 1883 or later were literate at the time of their marriage (Graph 1), the study is limited to the sample of persons born before 1883. For this group information is available for the provinces of Zeeland, Utrecht and Friesland, and the city of Rotterdam and its immediate surroundings (Figure 1). Dutch population registers recorded all life events (birth, death, marriage and migration) of individuals within their households, and noted additional information on occupation and religion. Since the population register was made obligatory in 1850 (Vulsma 1988; Maarseveen 2007: 429-431), the study sets off in that year.

Data on the determinants of literacy at marriage is extracted from the birth certificates as much as possible (Figure 2). This moment of observation is the closest to the period of schooling. The selected variables are: gender, date and place of birth, signature (on the birth certificate) of the father, and occupation of the father at the time of birth. We opted to retrieve this information only for the father, because mother's measurement of socioeconomic status is very difficult to reconstruct and often unavailable (Van Poppel, Van Dalen & Walhout 2009). Missing information on the occupation of the father is not supplemented by information from his marriage certificate, since we found the time gap between his marriage and the births of his children too wide to have substantive meaning. The occupations are coded according to the HISCO occupational coding scheme (van Leeuwen, Maas and Miles 2002) and grouped in twelve social classes according to the HISCLASS classification (Maas and van Leeuwen 2004; van Leeuwen and Maas, 2011). These classes are merged into

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<sup>1</sup> In the period under observation, the proportion of married people remained almost constant (van Poppel 1992: 21-22).

<sup>2</sup> See <<http://www.iisg.nl/hsn/>> for more information on the Historical Sample of the Netherlands (HSN).

six groups according to the model of Boonstra (Table 1). The father's ability to sign the birth certificate of his child was registered as well. This information is missing in a number of cases, especially when the father was not married to the mother and unwilling to recognize his child (Kok 1991: 34-37). Next to these indicators, we also created a variable on the (degree of) urbanization of the birthplace. We followed the distinction proposed by Kooij (1985: 111-113; 2007) between urban and rural municipalities: 'urban' here stands for a town with over 10,000 inhabitants and with less than two and a half per cent of the population employed in the agricultural sector.

The family situation is reconstructed with data from the population registers. To measure the effect of birth order and number of siblings, five variables were created: number of older brothers, number of older sisters, number of younger brothers, number of younger sisters, and total number of siblings (the sum of the preceding four variables). We counted the number of living siblings at the time that the research person is six years, an age which approaches the onset of schooling for most children in the Netherlands (Knippenberg 1986). To be able to test the resource dilution hypothesis, the number of younger brothers and sisters is adjusted for siblings that were born later on, up until the time the research person left the household. Siblings who died before the person under observation was six years old, as well as step-or half-brothers and -sisters, are not included.

The Dutch population registers also allow to measure religious denomination at the individual level. Because people tend to change religious denominations during their life courses, we have opted for the first religion ever mentioned (which is around the time of birth). Besides Protestants and Catholics we discerned a category of 'other or unknown' religion, which contains the following groups: Jews, Nondenominationalists and those whose religion was unknown. Despite considerable regional variation, these minority groups only accounted for approximately 3.5 % of all denominations (Knippenberg 2003: 116-120; Beekink and de Vos, 2008: 105-106). Finally, the population registers also allow to establish whether the father was deceased before the age of six (before there had been some schooling) of children. After this selection process 1.723 research subjects remained for further analysis, 816 of them boys and 907 girls (Table 2).

The effect of the independent variables on the ability to sign his or her marriage certificate can be measured with logistic regression analysis (Menard 1995; Hosmer and Lemeshow 2000). The results are shown in Table 3. Both the coefficients,  $b$ , and the odds ratios,  $\exp(b)$ , are reported. Models 1 and 2 show only results for boys and girls respectively. The results of both sexes combined can be found in model 3. By adding interaction terms with sex (model 4) gender effects can be detected (Jaccard 2001).

## Results

As expected, more boys than girls were literate. In the period and regions under investigation, girls were only half as likely to be literate than boys (odds ratio 0.58). Also as expected the chance to be literate increased for successive birth cohorts, both for boys and for girls. The schooling of the father was important for both boys and girls: children from a literate father were more likely to become literate themselves. The results for the occupation of the father are interesting and instructive. Compared to the children of unschooled workers, more sons and daughters of farmers and lower schooled workers were able to sign, controlled for the literacy of the father. Did these groups invest more in their children (as suggested in Boonstra 2008: 139-144)? Was that inspired or motivated by their own negative experiences? Or did their children benefit more from schooling? This is difficult to interpret, because this study is limited to a late stage of the literacy process. In this stage the higher occupational and educational levels (amongst who literacy spread earlier and faster) had only limited room for further improvements in literacy. Conversely, groups whose literacy levels were historically lagging behind had more space – and were perhaps also under more pressure – to catch up. This was most visible in families of farmers and of lower schooled workers. That the father was illiterate, reduced the chance that his child was literate significantly (odds ratio 0.33 for the total group). This is statistically significant for both boys and girls. An early death of the father (before the sixth anniversary of his child, the person under observation) has no statistically significant effect, neither for boys nor girls.

The direction of the effects of urbanization (of the place of birth) and province (also of place of birth) confirm what can be expected (Boonstra 2009): rural areas were less literate, and the more southern the province of birth, the greater the risk of illiteracy. However, these differences are not significant. The results for religious denomination are to be expected as well, with Catholics being less often literate than Protestants, but again these results are not significant. Previous research for the Netherlands showed that in areas with many Catholics, non-Catholics (mainly Protestant) were clearly more often literate (Boonstra 1993). Those Catholic regions were among the last and slowest in the Netherlands to develop widespread literacy (Boonstra 2009: 64-73). However, the regions in this study are all mainly Protestant (Knippenberg 2003: 96-101). Possibly the presence of the network of (Protestant) state schools favoured the educational participation of Catholics (in Protestant areas) as well. They acted as some kind of exemplary model, which stimulated the Catholics in the very same regions to build out a network of Catholic (private) schools. This must be interpreted in the context of the Dutch School Struggle (see e.g. Boekholt 1985). Perhaps the ongoing School Struggle explains why the differences between religious denominations in the mainly Protestant regions are present, be it not very distinct.



The main purpose of this investigation is to determine whether the number of siblings and the composition of the sibling set have an impact on literacy in the nineteenth century. In addition to the multivariate analysis we also graphically display the effect of the siblings on literacy, as predicted by bivariate logistic models (Graphs 2, 3, 4 and 5). In the first two of these graphs we see the resource dilution hypothesis confirmed: the more siblings, the less literate boys (Graph 2) and girls (Graph 3) will be.

When a distinction is made between the gender and relative age of the siblings (Graph 4 for boys, Graph 5 for girls), this general picture is altered. It appears that the presence of brothers, both older and younger ones, has a negative effect on literacy. One or more older brothers considerably reduced the chance to sign one's marriage certificate (more than 25 percent for brides, grooms for more than 40 percent, and that for each older brother). This is also true for having younger brothers: boys saw a notable decrease in their opportunities to become literate when they had younger brothers (odds ratio 0.78). For girls, the effect goes in the same direction, but in the multivariate models is not significant. The interaction terms (model 4) do not reveal any significant differences between boys and girls concerning having brothers. Looking only at the brothers, family size (the variable is not directly measured) appears to have a negative effect on literacy. The more sons in the family, the lower one's educational opportunities, and that for both boys and girls. This finding seems to corroborate the resource dilution model, but only for the male part of families.

Interestingly, the effect of having sisters runs differently, and it is not clear. In graphs 4 and 5, the presence of younger sisters has no visible (or significant in Table 3) effect on the literacy of the person under observation, neither for boys nor girls. However, the graphs show a strong, positive effect for (the number of) older sisters on one's literacy, both for girls and for boys. When adding controlling variables, it is only significant for girls. Each older sister increases the odds for a girl to sign her marriage certificate with 65 percent. For boys that effect in Table 3 is negative (although the effect is only statistically significant at a 0.10 level:  $p = 0.09$ ). When keeping other variables constant, boys saw their educational opportunities decrease by having older sisters (odds ratio 0.76), as was the case with having older brothers. We stress the importance of the controlling variables, which reverse the effect of having older sisters for boys. The interaction effect (model 4) is significant: for girls the effect of having older sisters is twice as important as for boys. Keeping other factors constant, older girls thus increased the likelihood of being literate for their younger sisters, but not for their younger brothers. This leads to a whole series of open questions: are young girls taught by their older sisters? And why is that only for girls? Were the gender roles such that in certain families older girls were assigned to learn their younger sisters to read and write, but not their younger brothers? Other research, both anthropological and demographic,

addressed the specific role of (firstborn) girls in helping to raise their younger siblings (see e.g. the tradition of *Kindsdirn* in preindustrial Austrian and German areas; Mitterauer 1982). Our analysis of literacy seems to support this idea, but suggests that this sibling aid was restricted to girls.

## Conclusion

The extent of literacy in historical demographic research is often measured by whether or not signatures were present on the certificates of the Civil Registration. It is a simple and limited, but nonetheless pretty good indicator. Previous research with this indicator shows, among others, that women in the nineteenth century had a disadvantage in terms of literacy, and were catching up only at a slow pace. Aside from gender other factors also played a role, such as occupation and literacy of the father.

This research has opened another line of thought, which responds to the increased attention from social psychologists and sociologists of the family for kinship relations and internal household dynamics. Our research question was whether the presence of older and younger siblings is related to someone's literacy. One view states that the number of brothers and sisters gives a good indication of family size, and it is generally accepted that the economic and social capacities of families decrease as their size increases. This is the basic idea of the so-called resource dilution model. If limited resources are to be distributed over a larger group, a Malthusian distribution mechanism starts to operate. Another view is that parents in the nineteenth century started to switch towards a smaller number of 'high quality' or better educated children, who would be better adapted to the social environment created by the industrial revolution. Both models hypothesize that smaller family sizes are equated with higher educational levels but neither model has specified whether this depends on the gender composition of families. This hypothesis is tested for the degree of literacy. Data comes from four Dutch regions for the birth cohort 1850-1883.

The results of this study, based on literacy data from four Dutch regions (1850-1883) can be interpreted as follows. The effect of the number of siblings on a person's ability to sign the marriage certificate appears to be a complex one. Having many brothers does significantly hamper this ability, both for brides and for grooms. The more brothers, the larger the family, the lower the educational opportunities of the children. This confirms the claim of the resource dilution model. For sisters this works differently. Where boys and girls are often less literate if they have brothers (be they older or younger), the presence of older sisters has a positive effect on literacy of girls. Remarkably, this effect does not apply to their brothers. Apparently in some families older sisters were easily and frequently assisting their younger sisters to learn how to read and write, but not their younger brothers! This collaborative learning process

thus goes through the female line. It stresses the importance of gender-specific micro-sociological interactions within families in the past.

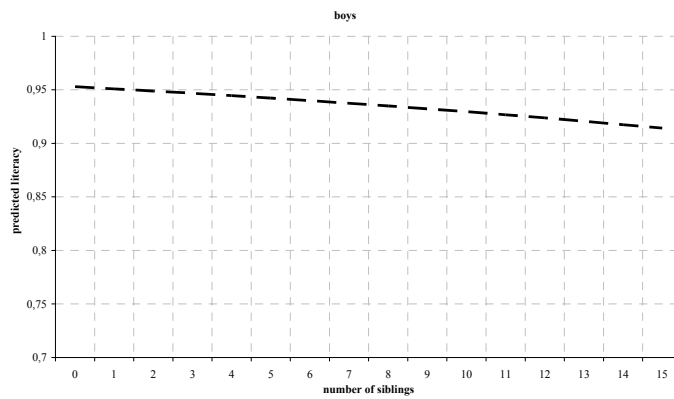
## Appendix

Graph 1: Evolution of Literacy (in %) According to Year of Birth, Brides and Grooms, Married in 1830-1900, 5-Year Averages



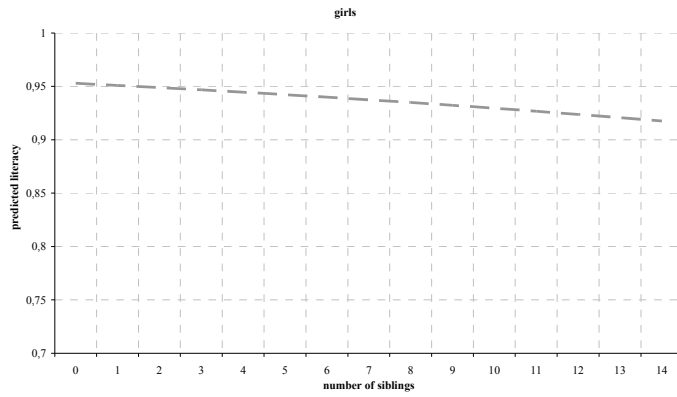
Source: HSN datasets Life Courses and Civil Certificates, release 2008.01.

Graph 2: Predicted Probability of Being Literate, According to the Total Number of Siblings (Boys)



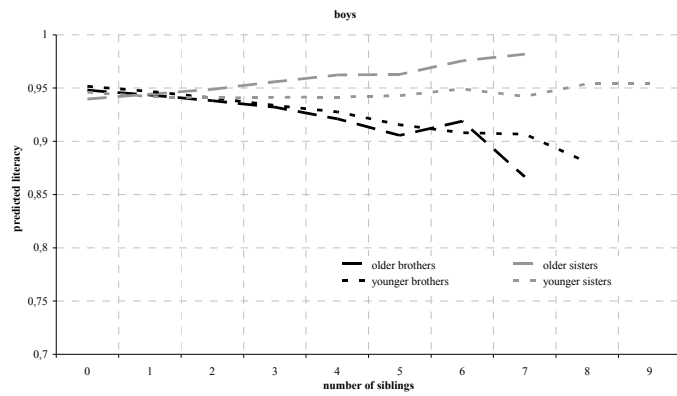
Source: HSN datasets Life Courses and Civil Certificates, release 2008.01.

Graph 3: Predicted Probability of Being Literate, According to the Total Number of Siblings (Girls)



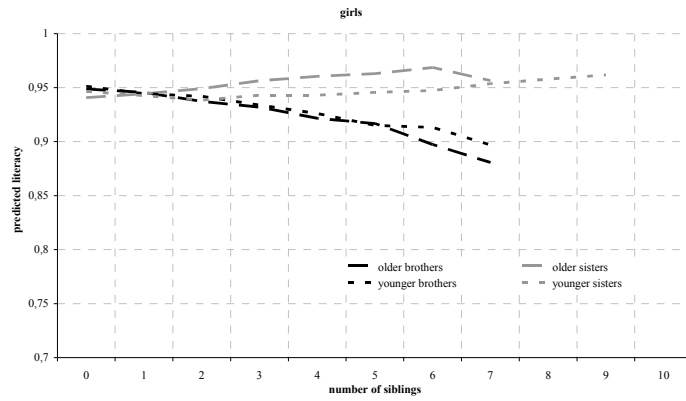
Source: HSN datasets Life Courses and Civil Certificates, release 2008.01.

Graph 4: Predicted Probability of Being Literate, According to Number and Gender of Siblings (Boys)



Source: HSN datasets Life Courses and Civil Certificates, release 2008.01.

Graph 5: Predicted Probability of Being Literate, According to Number and Gender of Siblings (Girls)



Source: HSN datasets Life Courses and Civil Certificates, release 2008.01.

Figure 1: Map Indicating the Sample Area of the HSN (a Sample of Birth Certificates Was Drawn from the Darker Parts)



Figure 2: Origin of Variables

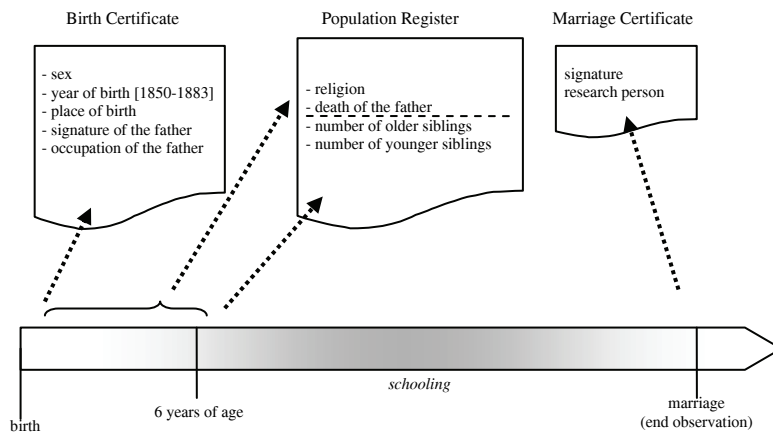


Table 1: Classification of Occupations According to the HISCLASS-Scheme

Occupational class		HISCLASS	
Class 1	Higher education	1	Higher managers
		2	Higher professionals
		3	Lower managers
Class 2	Secondary education	4	Lower professionals, clericals and salesmen
		5	Lower clericals and salesmen
Class 3	Schooled	6	Foremen
		7	Skilled workers
Class 4	Farmers	8	Farmers
Class 5	Lower schooled	9	Lower skilled workers
		10	Lower skilled farm workers
Class 6	Unschoolled	11	Unskilled workers
		12	Unskilled farm workers

Source: Regrouping of 12 occupational classes into 6 classes according to Boonstra (2008:131).

Table 2: Numbers, Percentages, Averages and Standard Deviations of the Predictors

	Model 1 (boys)		Model 2 (girls)		Model 3-4 (total)	
	N	% (S.E.)	N	% (S.E.)	N	% (S.E.)
<i>Sex</i>						
Male					818	47,3%
Female					910	52,7%
<i>Birth cohort</i>						
Before 1860	321	39,2%	318	35,1%	639	37,0%
1860-1869	334	40,8%	361	39,8%	695	40,3%
1870 or later	163	19,9%	228	25,1%	391	22,7%
<i>Occupational class of the father</i>						
Class 1 – higher	40	4,9%	42	4,6%	82	4,7%
Class 2 – secondary	77	9,4%	91	10,0%	168	9,7%
Class 3 – schooled	116	14,2%	111	12,2%	227	13,1%
Class 4 – farmer	96	11,7%	130	14,3%	226	13,1%
Class 5 – lower schooled	79	9,7%	75	8,2%	154	8,9%
Class 6 – unschooled	331	40,5%	349	38,4%	680	39,4%
Occupation unknown	79	9,7%	112	12,3%	191	11,1%
<i>Literacy of the father</i>						
Father is able to write	624	76,3%	675	74,2%	1299	75,2%
Father is not able to write	93	11,4%	103	11,3%	196	11,3%
Unknown	101	12,3%	132	14,5%	233	13,5%
<i>Father died (before research person is 6 years old)?</i>	34	4,2%	28	3,1%	62	3,6%
<i>Place of birth</i>						
Urban	247	30,2%	298	32,7%	545	31,5%
Rural	571	69,8%	612	67,3%	1183	68,5%
<i>Region of birth</i>						
Friesland	309	37,8%	339	37,3%	648	37,4%
Utrecht	194	23,7%	198	21,7%	392	22,7%
Rotterdam and surroundings	126	15,4%	157	17,3%	283	16,4%
Zeeland	189	23,1%	216	23,7%	405	23,4%
<i>Religion</i>						
Protestant	649	79,3%	707	77,7%	1356	78,5%
Catholic	142	17,4%	160	17,6%	302	17,5%
Other or unknown						
Jew	9	1,1%	10	1,1%	19	1,1%
Nondenominational	2	0,2%	1	0,1%	3	0,2%
Unknown	6	0,7%	13	1,4%	19	1,1%
<i>Number of older brothers (average)</i>	0,84	(1,10)	0,89	(1,20)	0,87	(1,15)
<i>Number of older sisters (average)</i>	0,78	(1,09)	0,79	(1,03)	0,79	(1,06)
<i>Number of younger brothers (average)</i>	1,37	(1,60)	1,21	(1,50)	1,28	(1,54)
<i>Number of younger sisters (average)</i>	1,31	(1,57)	1,17	(1,47)	1,24	(1,52)
N	816		907		1723	

Source: HSN datasets Life Courses and Civil Certificates, release 2008.01.

Table 3: Logistic Regression of Ability to Sign the Marriage Certificate (Four Models)

	Model 1 (boys)		Model 2 (girls)		Model 3 (total)		Model 4 (total, interactions)	
	b	P	b	P	b	P	b	P
<i>Intercept</i>	4.20	<0.01	2.35	<0.01	3.27	<0.01	3.92	<0.01
<i>Sex</i>								
Male ( <i>ref.</i> )					0.00	/	0.00	/
Female					-0.55	0.02	1.40	0.25
<i>Birth cohort</i>								
Before 1860 ( <i>ref.</i> )	0.00	/	0.00	/	0.00	/	0.00	/
1860-1869	0.22	0.57	0.70	0.03	0.55	1.73	0.54	1.72
1870 or later	1.76	0.03	1.77	<0.01	1.79	6.00	1.72	5.60
<i>Occupational class of the father</i>								
Higher	0.63	1.87	1.02	0.56	0.88	2.41	0.91	2.47
Secondary	0.48	1.61	0.33	0.57	0.35	1.42	0.38	1.46
Schooled	-0.01	0.99	1.84	0.99	0.93	2.54	0.91	2.49
Farmer	1.95	7.01	2.78	0.07	2.44	11.51	2.47	11.85
Lower schooled	1.76	5.84	2.13	0.10	1.948	7.01	2.00	7.38
Unschoolled ( <i>ref.</i> )	0.00	1.00	0.00	/	0.00	1.00	0.00	1.00
Occupation unknown	-17.34	-	0.91	0.99	0.45	1.57	0.42	1.52
<i>Literacy of the father</i>								
Father is able to write ( <i>ref.</i> )	0.00	1.00	0.00	/	0.00	1.00	0.00	1.00
Father is not able to write	-1.61	0.20	-0.92	<0.01	-1.12	0.33	-1.16	0.31
Unknown	17.68	-	-0.27	0.99	0.76	1.15	0.13	1.14
<i>Father died (before child is 6 years old)?</i>	0.28	1.32	-0.59	0.80	0.40	0.92	-0.14	0.87
<i>Place of birth</i>								
Urban ( <i>ref.</i> )	0.00	1.00	0.00	/	0.00	1.00	0.00	1.00
Rural	-0.43	0.65	-0.24	0.48	-0.3	0.74	-0.4	0.67
<i>Region of birth</i>								
Friesland ( <i>ref.</i> )	0.00	1.00	0.00	/	0.00	1.00	0.00	1.00



Table 3 continued...

Utrecht	-0.01	0.99	-0.62	0.54	0.13	-0.39	0.68	0.22	-0.41	0.67	0.20
Rotterdam and surroundings	0.54	1.71	0.58	1.38	0.66	0.42	1.53	0.47	0.34	1.40	0.56
Zeeland	-0.37	0.69	-0.66	0.52	0.06	-0.55	0.58	0.05	-0.58	0.56	0.04
<b>Religion</b>											
Protestant (ref.)	0.00	1.00	0.00	1.00	/	0.00	1.00	/	0.00	1.00	/
Catholic	-0.49	0.61	-0.25	0.78	0.53	-0.32	0.73	0.29	-0.34	0.71	0.26
Other or unknown	-0.42	0.65	-0.81	0.45	0.16	-0.80	0.45	0.10	-0.81	0.45	0.10
Number of older brothers	-0.36	0.70	-0.23	0.79	0.08	-0.25	0.78	0.01	-0.37	0.69	0.02
Number of older sisters	-0.28	0.76	0.50	1.65	0.01	0.10	1.10	0.44	-0.26	0.77	0.10
Number of younger brothers	-0.25	0.78	-0.07	0.93	0.46	-0.14	0.87	0.06	-0.25	0.78	0.04
Number of younger sisters	0.07	1.08	-0.05	0.95	0.67	0.03	1.03	0.74	0.08	1.08	0.58
<b>INTERACTIES</b>											
Number of older brothers*sex (female)									0.15	1.17	0.45
Number of older sisters*sex (female)									0.76	2.14	<0.01
Number of younger brothers*sex (female)									0.19	1.21	0.23
Number of younger sisters*sex (female)									-0.11	0.89	0.54
Chi <sup>2</sup>	55.937*			87.350*			123.522*			137.049*	
Nagelkerke R <sup>2</sup>	0.218			0.236			0.197			0.217	
N	816			907			1723			n = 1723	

Source: HSN datasets *Life Courses and Civil Certificates*, release 2008.01.

\* p < 0.001

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