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Abstract

If social outcomes have social causation, mothers and fathers in different societies will have different effects on child outcomes. Social mobility rates on the patriline will differ from that on the matriline. From an extensive family lineage of 426,552 persons in England 1650-2023 we estimate the influence of mothers versus fathers on social outcomes 1754-2023. Mothers' and fathers' education and social status are equally predictive of most child social outcomes across the entire period, even for the patriarchical society of eighteenth-nineteenth century England. Only for wealth was there a much stronger influence of the patriline.

JEL Codes: J16, J62

Keywords: Gender and social mobility, mothers versus fathers, gender equality

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Social and cultural theories of status determination will generally predict that mothers and fathers have unequal effects. Mothers in all societies, for example, even today, play a disproportionate role in child nurture. Thus surveys of time use 1990-2001 found mothers always spent at least twice as much time in child care than fathers, even in the most gender equal societies such as Norway.[1] This parental time differential was even greater in earlier years. This implies mother characteristics will have greater importance in predicting child outcomes than father. Arleen Leibowitz, for example, concludes that "since mother's time expenditures on children exceed that of fathers by at least a factor of 4, we would expect the significance and size of the coefficient of mother's education to exceed that of father's education' (Leibowitz, 1974, S116).

Though mothers spend more time with children, however, fathers in most societies had disproportionate access to income, wealth, and professional qualifications and careers. In England, for example, up until 1882 husbands hadcontrol of women's property after marriage. Fathers also had sole legal authority over children. So fathers likely play a more important role in funding child schooling and training, providing access to career opportunities, and in forming child aspirations and achievement. Conventional approaches to social mobility in England up until the 1980s thus regarded the father's social status as determining the social status of families, and hence child social outcomes (Goldthorpe, 1983, 1984).

Thus we would expect fathers to be more important to child social outcomes in earlier eras, such as the nineteenth century, when employment and higher education was dominated by men. But in more recent years the characteristics of mothers

[1] Guryan, Hurst, and Kearney, 2008, table 4.

should come to dominate child outcomes, given their continuing greater role in childcare and nurture.[2]

There is even the possibility that the relative impact of fathers and mother could depend on the gender of the child, or on the social class of the parents. In England before WWII, for example, in upper class families childcare and education was largely delegated to servants and (for boys) to private residential schools such as the famed Eton, Rugby, and Harrow. The economic resources to hire those servants and pay school fees came mainly from fathers. In lower class families, in contrast, mothers would play a much more direct role in the lives and education of their children. So perhaps fathers mattered more in upper class homes for sons, and mothers in the homes of the working-class sons.

In the genealogical database we use here to measure the comparative influence of fathers and mothers, the Families of England (FOE) Database, there is a strong and stable persistence of social status across many generations. This has the implication that it takes at least 10 generations for the descendants of high and low status families to regress to the social mean. Could this in part come from the FOE database mainly tracing descent on the male line? Is there potentially much more social mobility on the maternal line, and hence also in society as a whole, where social mobility is generally measured by comparing sons to fathers?

[2] Note that Francis Galton in a 1904 paper remarks parenthetically on "A popular notion that ability is mainly transmitted through female lines." Galton, 1904, p. 355.

Previous Studies

Despite the expectations of greater influence by mothers, the existing empirical literature on the contemporary comparative effect of mothers versus fathers on child outcomes tends to find little difference in effects across parents.

. Marks (2008), for example, looked at child test scores at age 15 in the PISA assessment of reading and mathematical performance in 2000, across 30 countries. What was the comparative strength of prediction of child scores from father versus mother educational attainment, measured by years of education? Averaged across the 30 countries, the predictive effect of mother and father education was of near equal magnitude for both reading and mathematics. In contrast, for occupational status the father effect was stronger than that of the mother in both reading and mathematics. But the difference was still less than 20% of the overall father effect (Marks, 2008, tables 1 and 2). And since some women leave outside employment in favor of childcare, the link between social abilities, education and occupational status will likely be noisier for women than for men.

Leibowitz (1974) examined years of education attained by the high IQ Terman sample of 1,528 children of 1921 as a function of mother and father years of education. For sons there was no significant difference in mother and father education as a predictor. For daughters the estimated mother coefficient was higher than for fathers, but the difference was not statistically significant (Leibowitz, 1974, tables 2-3).

Large scale studies by Plug (2004), Björklund, Lindahl and Plug (2004, 2006), and Holmlund, Lindahl and Plug (2008), mainly using Swedish data, regressed child years of education on both biological parents' years of education, and generally found close matching of the mother and father coefficients. The only exception was Holmlund, Lindahl and Plug (2008) where the coefficient on father years of education in Sweden (0.152, s.e. 0.002) was less than that of the mother (0.198, s.e. 0.002).[3]

For adoptive children, the influence of the adopting parents on child years of education would be limited to social pathways, so based on time inputs by parents,

[3] Holmlund, Lindahl and Plug (2008), table 1 and table 3, summarizes these studies.

the influence of mothers in recent years should be relatively stronger. For Swedish children adopted by Swedish parents the average coefficient on the father's years of education across 3 studies was 0.07, and for the mother's 0.06.[4] For foreign children adopted by Swedish parents the mother and father coefficients were both insignificantly different from 0 (0.014, s.e. 0.009, versus 0.015, s.e. 0.009).[5]

Heckman and Hotz (1986) report from a survey of families in Panama in 1983, where those studied had at least one son aged 18 and above, that son's years of education were equally predicted by father's versus mother's years of education. Also for male "head of household," education was equally predicted by his father's versus mother's years of education.[6]

At least for education, then, we see clear indications in the literature of equal mother and father effects for societies where mother and father education levels tend to be relatively equal. Does this hold for the much more gender unequal societies of the past?

Because of the absence of occupations and education for most women before the last few generations, and the difficulty tracing the maternal line of descent because women change surnames at marriage, there is little evidence on the comparative social mobility of men and women in any earlier period. Paserman and Olivetti, 2015, and Paserman, Olivetti and Salisbury, 2018, estimate for the USA 1850-1940 social mobility of women using as a proxy linkage across generations first names. They find in the earlier USA less intergenerational persistence of female status than for men. In contrast Espín-Sánchez, Ferrie, and Vickers, 2023, using occupational income in the USA 1900-40 find that "The mother's contribution to mobility is almost five times larger than the father's"[7]

[4] Holmlund, Lindahl and Plug (2008), table 1 and table 5.
[5] Holmlund, Lindahl and Plug (2008), table 5.
[6] Heckman and Hotz, 1986, table 10.
[7] Espín-Sánchez, Ferrie, and Vickers, 2023, p. 3.

Estimating Mother versus Father Effects in a Patriarchical Society

The first problem we have to deal with for England before the modern era is that documentary sources reveal little about the educational attainment and occupational abilities of women. Married women in the censuses 1841-1921, and the population register of 1939, generally have no occupation recorded. Even single women of the upper classes are typically listed with no status indicated, or under such terms as "gentlewoman" and "private means". Women were largely excluded from universities, and professional societies, before 1920.

As an example, consider Emma Wedgwood (1809-1896), who married Charles Darwin in 1839, and was mother of 10 children, three of whom became Fellows of the Royal Society. She appears in the census reports of 1851-1891, but only once with an occupational descriptor. In 1851 she is described as a "gentlewoman." Otherwise nothing is recorded of her educational attainments in school records, marriage records, or the censuses. Yet from other sources we know she was a virtuoso pianist, and that she had gone on a grand tour of Europe in her youth (Healey, 2001). In the 1861 census while the Darwins' son George Howard, 15, was listed as a scholar, no occupation was listed for his sister Henrietta Emma, 17. Henrietta we also know from other sources to be highly educated. She later served as editor for a number of her father's books.

To give another example, Elizabeth Theresa Frances Kelsey (1875-1931) the wife of Samuel Courtauld, the industrialist, was an art collector, and founder of the Courtauld Art Institute in London. In the census of 1901, aged 26 just before her marriage, she is listed living with her widowed mother and with no occupation. In the 1911 census she again has no occupation, and is in a household with her husband, one daughter, and four servants, one of whom is a "child's maid." Yet Elizabeth Courtauld was a well-known hostess, and a promoter of both modern art and modern music. Along with Malcolm Sargent, the famous conductor, she launched an innovative concert series in London 1927-31 that attracted notable international performers.[8]

The Darwin household records in the census also suggests that if child nurture and education are the crucial paths to success, fathers will be more important to

[8] https://www.fondationlouisvuitton.fr/en/events/filippo-gorini

child outcomes than mothers in richer households. The relative wealth of the Darwins is shown in the considerable numbers of servants who assisted in household tasks and childcare. Thus in the 1851 census, the Darwin household had 4 children at home ages 1-5, but a total of 8 servants, including two nursery maids. By 1861 there were 7 children at home ages 9-21, and now 11 servants, including a governess and two nurses. If the resources to hire these servants and to pay for high quality education largely derived from the husband's wealth and occupation, then in upper class families husbands would much more strongly determine child outcomes than wives.

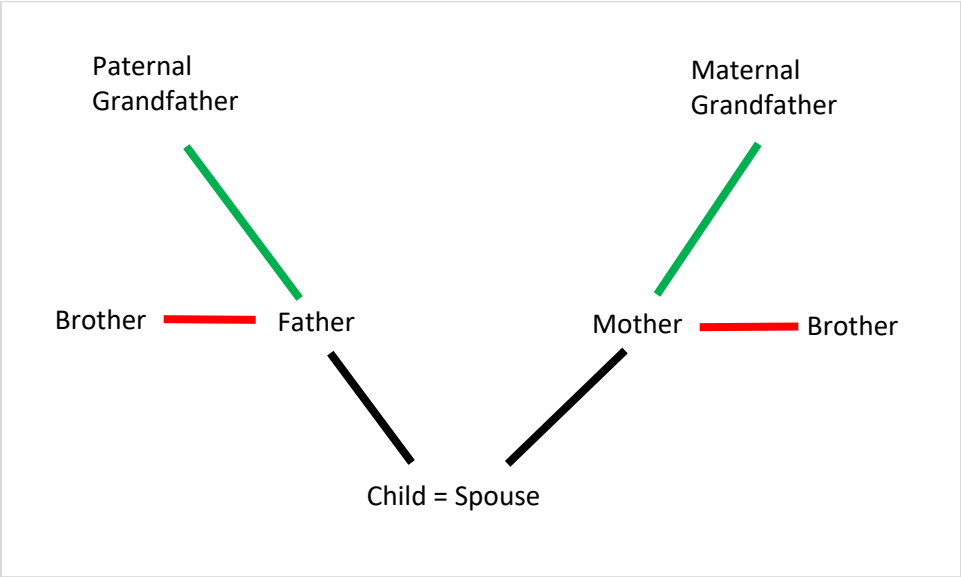
The laws of marriage in England and Wales, however, from 1754 on required both parties to sign the marriage register. So we know for a substantial number of parents the literacy at marriage of both father and mother from 1754 on. This measure will be a good index of the educational status of lower class families, since by 1754 almost all upper class men and women were literate. Since overall literacy measured at marriage had risen above 90% by 1890 in England, this measure is only useful, however, for marriages before then.

Using literacy we can thus directly measure the predictive content of father and mother education for child outcomes, where these outcomes are being observed in work or schooling ages 10-18, attainment of higher education (sons), literacy at marriage, and occupational status around age 40 (sons).

For women born before 1920 there is almost no other direct evidence on educational attainment and occupational status than literacy at marriage. Women do have wealth at death, but the transmission of wealth was much more significant between fathers and sons than to wives and daughters. For women observed 1999 and later we observe their house value and the social quality of their neighborhood – though this is determined for those married in conjunction with their spouses.

However, in these other cases, we can use men and women's fathers' or brothers' characteristics as a proxy for their status. For sons we can then determine the relative contribution of their paternal versus maternal grandfathers in predicting their outcomes, as in figure 1. We can test the relative influence of the patriline versus the matriline by estimating the size of the coefficients b_p and b_m in the regression

Figure 1: Determination of Child Outcomes: Paternal versus Maternal Line



$$y = b_p y_{gf} + b_m y_{gm} + e \quad (1)$$

An alternative proxy for the influence of the mother is her brother. We can then estimate the parameters in the equation

$$y = b_p y_{bf} + b_m y_{bm} + e \quad (2)$$

where y_{bf} is the status of the father's brother and y_{bm} the status of the mother's brother. Again what is the relative effect of the paternal line versus the maternal line?

Literacy of Fathers and Mothers

As noted, from 1754 onwards brides and grooms in England and Wales were required to sign the marriage register. Where they could not sign, they made a mark. In the FOE database literacy rates at marriage for average lineages in the 18th century averaged 65%, but by the 1880s had risen to 89%. Thus we utilize this measure only for marriages in the period 1754-1889. Women were about 10% less likely to be literate than men over this interval.[9] Table 1 shows the data available on parent literacy by decade of marriage 1750-1880, and the outcome variables for children, again by decade of parental marriage. For child literacy the results are from marriages centered around 1820, while for children at work or in schooling aged 10-18 the results are from marriages centered around 1860.

We can thus test for children born in the interval 1754 to around 1900 the relative influence of father literacy as opposed to mother literacy at marriage on a variety of child outcomes. Was there a significantly greater influence on child outcomes of father's education as opposed to mother's?

This estimation can be done in two ways. The first is through estimating the coefficients b_f, b_m in the expression

$$y_c = a + b_f dlit_f + b_m dlit_m + e \qquad (3)$$

where $dlit_f$, $dlit_m$ are indicators for paternal and maternal literacy, and y_c are a variety of child outcomes. The test of symmetry in father and mother effects is whether $\hat{b}_f = \hat{b}_m$? A second way of estimating the relative influence of fathers versus mothers, which imposes no structural form, is to estimate

$$y_c = a + b_{10} dlit_{10} + b_{01} dlit_{01} + b_{00} dlit_{00} + e \qquad (4)$$

where $dlit_{10}$, $dlit_{01}$, and $dlit_{00}$ are indicators for father and mother literacy in the combinations (1,0), (0,1), and (0,0). The test of the symmetry of father and mother

[9] Marriage registers are available only for some counties, but these are a diverse sample: Derbyshire, Dorset, Essex, Gloucestershire, Lancashire, Middlesex, Norfolk, Northampton, Nottingham, Oxfordshire, Somerset, Surrey, Sussex, Wiltshire, Worcestershire, Yorkshire (West Riding), Yorkshire (North Riding), Wales.

Table 1: Summary Statistics on Literacy at Marriage

Marriage Decade	Parent Literacy	Child Literacy	Work/ School 10-18	Occupation Status (sons)	Higher Education (sons)
1750	82	67	0	25	29
1760	178	113	0	91	101
1770	260	175	0	139	151
1780	344	209	0	212	213
1790	641	399	4	346	358
1800	717	440	38	392	393
1810	1,136	627	218	631	646
1820	1,263	639	519	662	672
1830	1,550	691	849	867	872
1840	1,935	733	1,186	1,027	995
1850	1,903	483	1,240	1,003	966
1860	2,132	118	1,500	1,156	1,170
1870	1,847	5	1,291	1,073	1,072
1880	1,653	0	913	970	971
All	15,641	4,699	7,873	8,594	8,725

Note: Observations are classified by the decade of the parents' marriage.

in effects on child outcomes is whether the indicator value for father literate, mother illiterate (1,0) has the same value for each child outcome as the indicator for father illiterate, mother literate (0,1).

Table 2 shows the estimated outcomes for both genders combined for children being at work or in education ages 10-18, child literacy at marriage, son occupational rank, and son attaining higher education. Literacy at marriage is measured both as the literacy of the child, and as the average literacy of the child and their marital partner. This second literacy measure has the advantage of taking values 0, 0.5, and 1 as opposed to just 0 or 1. For being at work or in education ages 10-18 the estimation controls for which census the observation came from (1851-1911). It also controls for the age of the child at the census (10-18).

For five of the six measures the effects of fathers and mothers are essentially identical. In only one case, attaining higher education, is there a difference, and in this case mother literacy is more predictive than father. However, we shall see below that with the alternative estimation strategy of equation (4) we do not observe any asymmetry for fathers' versus mothers' literacy and higher education.

Figure 2 shows graphically the coefficient estimates for each child outcome from equation (4) , for both or one parent being illiterate, compared to both parents literate, and the 95% confidence intervals of these estimates. Again in all but one case, this being son occupation, parent illiteracy has the same negative predictive effect on child outcomes for mother illiteracy compared to father illiteracy. For son occupation mother illiteracy predicts more of a decline in son rank that does father illiteracy

Table 2: Parental Literacy and Child Outcomes, both genders

Child Outcome	Observations	Father Literate	Mother Literate	Difference
At work 10-18	7,626	-0.134**	-0.146**	0.011
		(0.022)	(0.028)	(0.022)
Scholar 10-18	7,626	0.105**	0.096**	0.008
		(0.014)	(0.014)	(0.019)
Literacy at marriage	4,699	0.212**	0.215**	-0.003
		(0.023)	(0.019)	(0.030)
Literacy at marriage (ave, both husband/wive)	4,651	0.175**	0.203**	-0.028
		(0.019)	(0.016)	(0.025)
Higher Education (sons)	8,725	0.035**	0.066**	-0.032**
		(0.003)	(0.005)	(0.006)
Occupational Status (sons)	8,594	7.847**	8.041**	-0.194
		(0.544)	(0.500)	(0.738)

Notes: *, ** indicates significantly different from 0 at the 5% and 1% level. Standard errors, clustered by fathers, in parentheses.

Figure 2: Effects of father and mother literacy on child outcomes

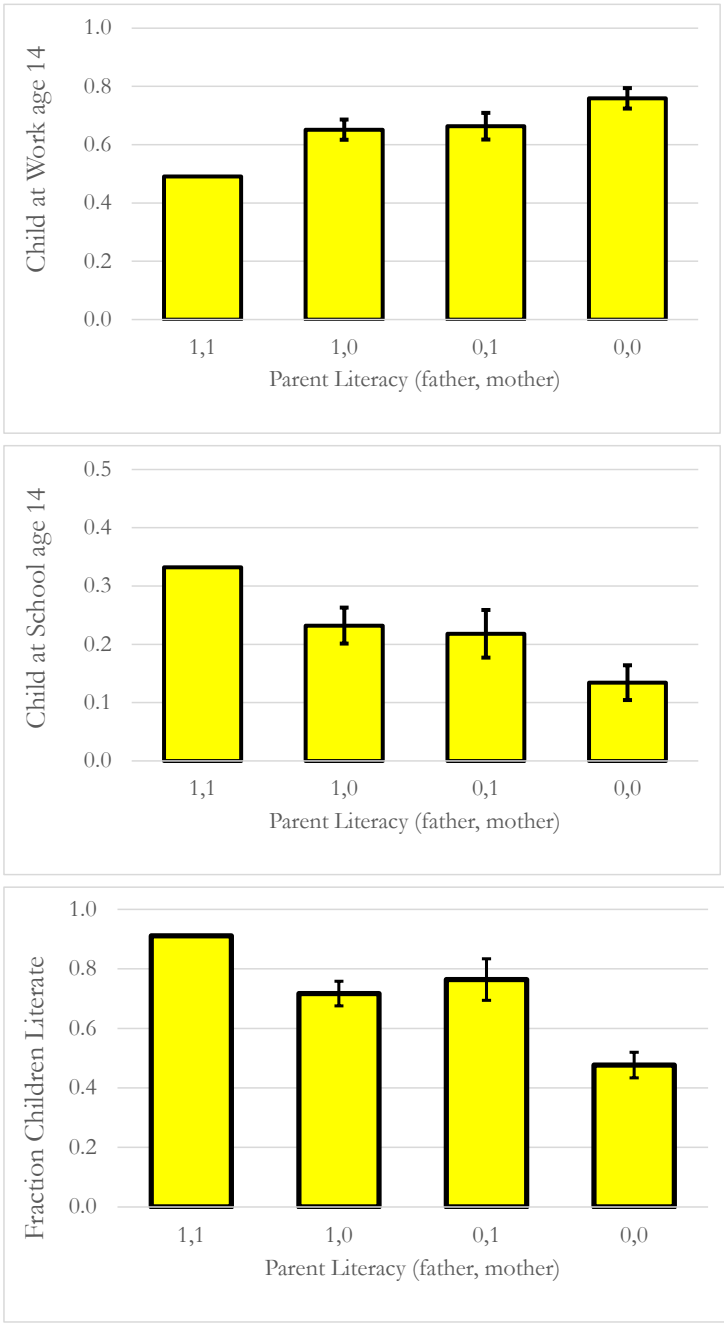
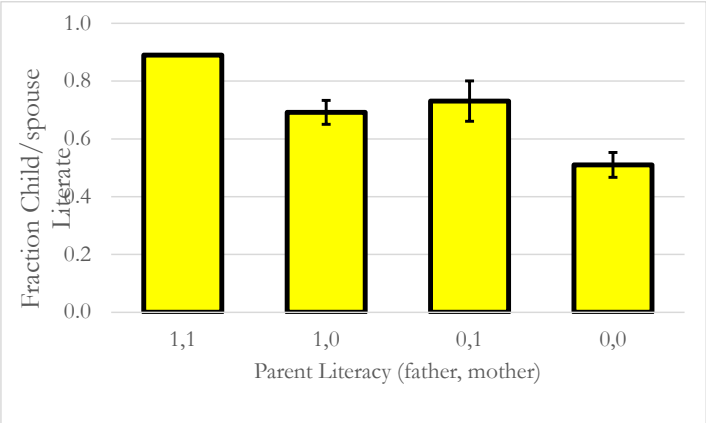
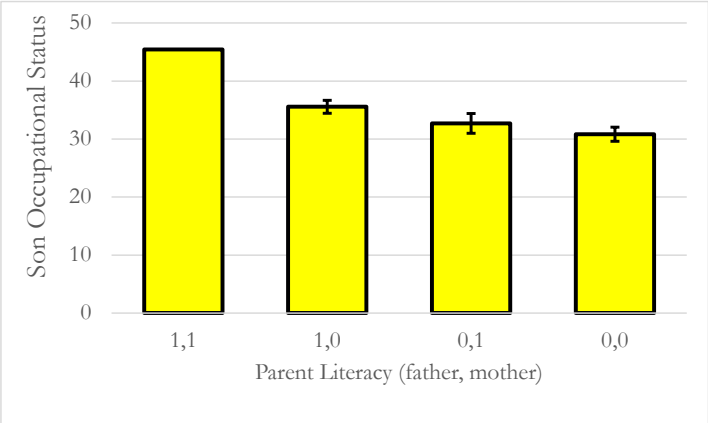
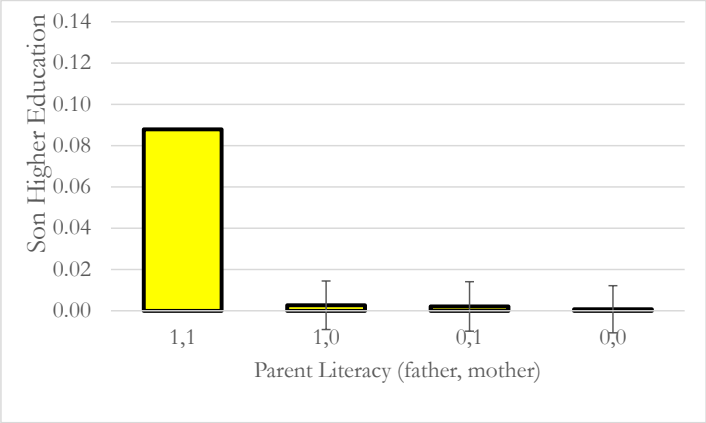


Figure 2 (continued)







Notes: Error bars show the 5% confidence intervals relative to the outcome where both parents were literate.

Table 3 separates the effects by gender of the child for work and schooling 10-18, and for literacy at marriage using equation (3). The subdivision of the data means that we do see increased standard errors on all estimates. Thus there is no statistically significant difference in the effects of mother literacy on daughter outcomes compared to father literacy on son outcomes in five of six cases. But there is sign that parental literacy had more predictive power for children of the same gender. For all six outcomes the coefficient on the same gender child has higher absolute value. Mother literacy, for example, better predicts daughters not being at work ages 10-18, or being in education, or being literate better than it predicts the same outcomes for sons.

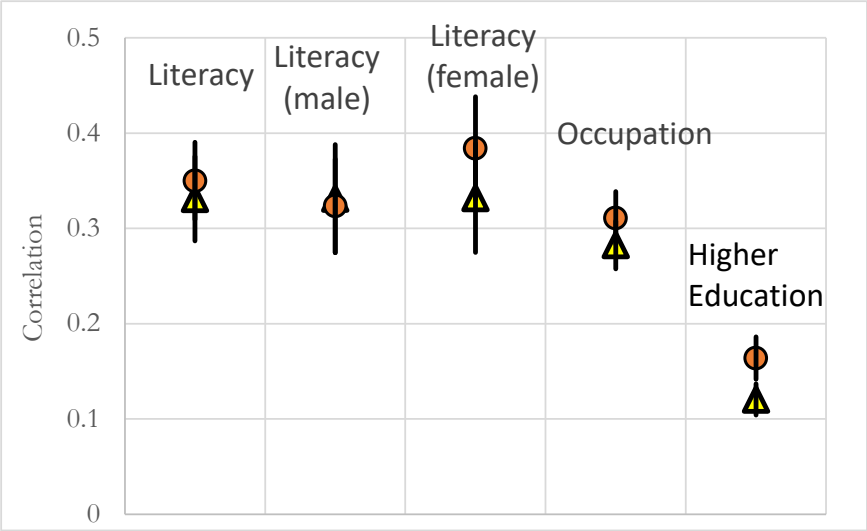
The overall impression of tables 2 and 3, and figure 2, is that even in nineteenth century England, with all the social and legal disabilities which attached to women, mother's education was generally of the same importance as father's as a predictor of a variety of child social outcomes.

Table 3: Parental Literacy and Child Outcomes, by Gender

Child Outcome	Observations	Father Literacy	Mother Literacy	Difference
At work 10-18 (son)	4,324	-0.162**	-0.125*	-0.037
		(0.019)	(0.018)	(0.026)
At work 10-18 (daughter)	3,302	-0.098**	-0.172**	0.074*
		(0.024)	(0.022)	(0.032)
Scholar 10-18 (son)	4,044	0.130**	0.099*	0.031
		(0.017)	(0.017)	(0.024)
Scholar 10-18 (daughter)	3,302	0.072**	0.093**	-0.021
		(0.019)	(0.018)	(0.026)
Literacy (son)	2,643	0.219**	0.178**	0.042
		(0.028)	(0.021)	(0.035)
Literacy (daughter)	2,056	0.196**	0.267**	-0.071
		(0.031)	(0.027)	(0.042)

Notes: **,* indicates significantly different from 0 at the 1%, 5% level. Standard errors, clustered by fathers, in parentheses.

Figure 3: Correlations between father and mother literacy and child outcomes, marriages 1754-1889



Notes: Circle indicates mothers, triangle fathers. 95% confidence interval for each correlation shown. Higher education correlation significantly higher (1%) for mother than for father literacy.

Figure 3 shows the individual correlations of child outcomes with father and mother literacy. This measures whether there was any greater status persistence on the paternal line as opposed to the maternal line. As can be seen, there is never any significant difference. Child outcomes were equivalently correlated to father and mother literacy. There may be a slightly higher correlation of child outcomes with the literacy of mothers, but none of the individual differences is significant at the 5% level.

A study of biological and adoptive families in Sweden for children born 1962-5 similarly showed roughly equal weight for father's and mother's years of education in predicting child years of education for children raised by their biological parents (Björklund, Jäntti, and Solon, 2007, table 2). This rough equality of affect was the same for sons and daughters.[10] So the gender equality we see in the effects of education in the modern era was also the experience of eighteenth and nineteenth century England.

[10] Interestingly these parental coefficients did not change when only the father or the mother raised the child. Absent parents predicted child outcomes as well as present ones. Björklund, Lindahl, and Plug, 2006 report similar parent equality in predicting child outcomes for university education.

While the results above show that mother's education was as good a predictor of child social outcomes as father's education, could it still be the case that father's status has a much more significant causal effect on child outcomes than does mother's status? Could mother's status just be providing more information on the true educational status of fathers, but the father's education be doing all the causal work?[11] Two things show this interpretation is not possible.

First, if mother status served just as additional information on underlying father status, mother status would be more imperfectly correlated to true underlying father status than was measured father status. So on this interpretation, the regression coefficient on mother status should have been significantly less than that on father status. If we simulate outcomes where the child status was determined only by underlying status of the father, but the mother has a status correlated with that underlying father status, then we do see clearly that in a joint regression, father status is a much stronger predictor of child status than is mother.

The parents of the fathers in the sample used in tables 2-3 themselves have literacy that was correlated with that of the father. Thus the literacy of the paternal grandfather had a correlation of 0.34 with father literacy, while their wife had a correlation of 0.43. But if we estimate the coefficients in the regression

$$y = b_f y_f + b_{gf} y_{gf} + e \qquad (3)$$

where y_f is father literacy and y_{gf} is grandfather literacy, we find the coefficient on father literacy, 0.30, is three times as large as on grandfather literacy, at 0.10. In contrast if we estimate child literacy on this same sample using both father and mother literacy, the coefficient on fathers is 0.18, and on mothers 0.25.[12] Thus it is very clear that mothers do not predict child outcomes just because they provide more information on the underlying status of fathers. Instead they must play an important causal role in determining child outcomes, and a role that the estimates suggest is equivalent to that of fathers.

[11] Again here this is not to imply that education itself creates child outcomes, as opposed to parental abilities which are correlated with education.

[12] The difference in these coefficients is not statistically significant.

Grandfathers as a Proxy for Fathers and Mothers

As discussed above, we are missing measures of occupational status and higher education for women born before 1920. We do have measures of wealth at death, but until recently bequests to sons typically exceeded those to daughters. The best measure we have of grandfather social status, in terms of its correlation across generations or between brothers, is occupational status. Table 4 shows the numbers of children where we know their social outcomes and the occupational status of their paternal and maternal grandfathers, by period of marriage of their parents. For house values and the Index of Multiple Deprivation we mainly observe the outcomes for marriages in the first half of the twentieth century. For the other outcomes we mainly observe outcomes for children born to marriages in the late nineteenth century.

Table 5 implements the estimation of equation (1) above for a variety of grandchild outcomes, using in all cases grandfather occupational status as the proxy for father and mother social status.

For almost all the outcomes in the table – house value and index of multiple deprivation 2002-2023, at work or in school aged 10-18, occupation and higher education status (males) – both grandparents significantly predict grandchild outcomes. In each case there is no statistically significant difference in the estimated coefficient for the paternal versus maternal grandparent.

The outcome that is most precisely predicted is the occupational status of grandsons, where the standard error of the coefficient for both grandfathers is less than 8% of the coefficient value. Here we can be confident at the 5% level that the difference in the coefficient between paternal and maternal grandfathers has to be less than 22% of the average coefficient value.

Table 4: Observations on Both Grandfather/Grandchild Outcomes

Grandchild Birth Period	House Value/IMD	Occupation (male)	Higher Education (male)	Work/School 10-18
1750-99	0	22	19	0
1800-49	0	407	403	393
1850-99	0	2,315	2,433	2,544
1900-49	2,157	589	1,376	345
1950-99	881	33	177	0
All	3,038	4,103	4,417	3,283

Table 5: Grandfather Occupational Statuses and Grandchild Outcomes

Child Outcome	Observations	Paternal Grandfather	Maternal Grandfather	Difference
Ln house value, 2017	3,154	0.0091**	0.0077**	0.0013
		(0.0008)	(0.0009)	(0.0012)
Index of Multiple Deprivation, 2019	3,164	0.129**	0.193**	-0.063
		(0.030)	(0.033)	(0.045)
At work 10-18 (1851-1939)	3,221	-0.0047**	-0.0041**	-0.0006
		(0.0005)	(0.0005)	(0.0007)
In School 10-18 (1851-1939)	3,221	0.0037**	0.0019**	0.0018*
		(0.0006)	(0.0006)	(0.0009)
Occupational Status (male)	4,091	0.334**	0.350**	-0.017
		(0.024)	(0.024)	(0.033)
Higher Education (male)	4,405	0.0036**	0.0047**	-0.0011
		(0.0004)	(0.0004)	(0.0006)

Notes: **, * indicates significantly different from 0 at the 1%, 5% level. Standard errors, clustered by fathers, in parentheses.

Table 6: Grandfather and Grandchild Wealth

Child Outcome	Observations	Paternal Grandfather Wealth	Maternal Grandfather Wealth	Difference
In wealth (all)	2,723	0.301**	0.115**	0.185**
		(0.020)	(0.021)	(0.029)
In wealth (male)	1,766	0.302**	0.138**	0.164**
		(0.025)	(0.025)	(0.034)
In wealth (female)	957	0.293**	0.085**	0.208**
		(0.031)	(0.028)	(0.042)

Notes: **, * indicates significantly different from 0 at the 1%, 5% level. Standard errors, clustered by fathers, in parentheses.

Table 6 shows the comparative prediction of grandchild wealth at death from paternal and maternal grandfather wealth at death (measured in logarithms). Here, in contrast to the other social outcomes, there is a clear and consistent asymmetry between the paternal and maternal line. The predictive effect of the paternal grandfather on grandchild wealth is about 3 times that of the maternal grandfather for both grandsons and granddaughters. That difference, as shown in the last column of table 6, is highly significant statistically.

Table 7: Grandfather Occupational Status and Grandson Outcomes, by family status

Lineage Status	Son Outcome	Son Average	Observations	Paternal grandfather	Maternal grandfather	Difference
High	Higher Education	0.369	1,046	0.0026**	0.0061**	-0.0035*
				(0.0013)	(0.0011)	(0.0017)
High	Occupational Status	65.0	993	0.259**	0.358**	-0.099
				(0.049)	(0.047)	(0.068)
Average	Higher Education	0.022	2,567	0.00145**	0.00144**	0.00001
				(0.0004)	(0.0003)	(0.0005)
Average	Occupational Status	37.9	2,602	0.294**	0.283**	0.011
				(0.032)	(0.031)	(0.045)

Notes: ** indicates significantly different from 0 at the 1% level. Standard errors, clustered by the child, in parentheses.

Table 7 shows the predictive effect of paternal and maternal grandfather occupational status on grandson outcomes, but now divided between rich versus average/poor family lineages, for grandsons born 1756-1919. Above we saw that, for upper class families, sons were largely raised by domestic servants and in private boarding schools. What should matter to their success is the funding provided by fathers to provide house space for servants and the servants themselves, and enrollment in quality schooling. In lower class families sons were raised mainly by their mothers, getting formal education mostly through public and charitable schools. But we see in table 7 that for upper class families the occupational status of the maternal grandfather was, if anything, more predictive of grandson status than was the paternal grandfather. And for average and lower class family lineages the

paternal and maternal grandfathers had equal weight in predicting grandson outcomes.

Uncles as Proxies for Parents

We can also proxy the effect of fathers and mothers on child outcomes by use of their brothers as proxies for their social status. Table 8 shows the estimated parameters of equation (2) above using the paternal and maternal uncles as proxies for the parents on predicting child outcomes. The outcomes here are being at work or at school ages 10-18, attainment of higher education for sons, and occupational status of sons.

The table shows that for all these outcomes the occupational status of paternal uncles predicts child outcomes in a symmetrical way with that of maternal uncles. Uncle status is always significantly linked with child status. But there is no statistically significant difference between paternal versus maternal uncles in predicting outcomes. The patriline and the matriline are again equally informative.

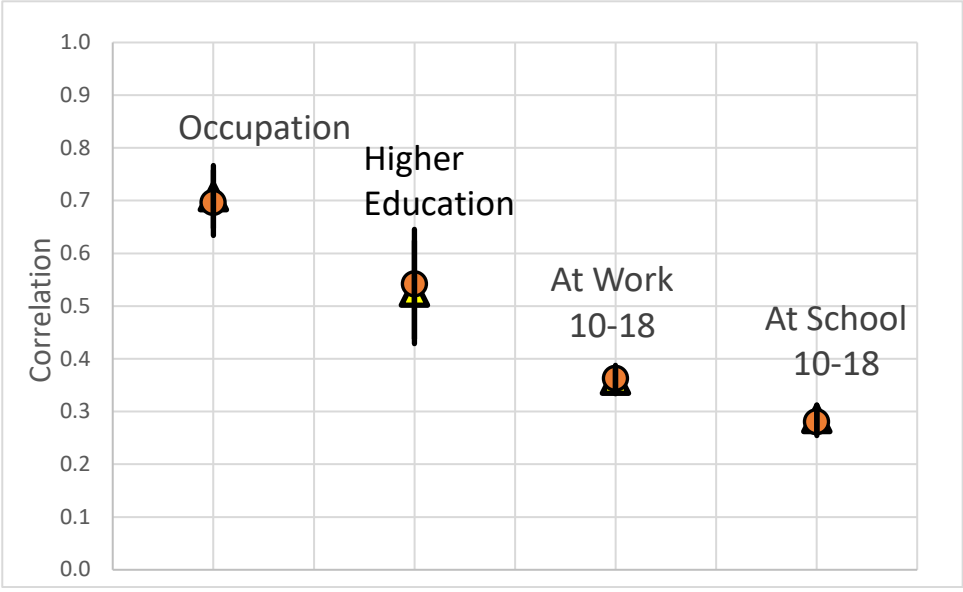
Figure 4 shows the correlation between a variety of child outcomes and the occupational status of their paternal and maternal uncles. In all cases the correlation is just as strong for the maternal uncles as for paternal uncles.

Table 8: Uncle Occupational Status and Child Outcomes, both genders

Child Outcome	Observations	Father's brother	Mother's Brother	Difference
At work 10-18	5,214	-0.0042** (0.0007)	-0.0037** (0.0008)	-0.0005 (0.0011)
In School 10-18	5,214	0.0031** (0.0007)	0.0025** (0.0009)	0.0005 (0.0011)
Higher Education (sons)	7,003	0.0040** (0.0005)	0.0049** (0.0006)	-0.0009 (0.0008)
Occupational Status (sons)	7,090	0.386** (0.027)	0.342** (0.027)	0.044 (0.038)

Notes: ** indicates significantly different from 0 at the 1% level. Standard errors, clustered by the child, in parentheses.

Figure 4: Correlations between child outcomes and paternal and maternal uncle occupational rank



Notes: Triangle = paternal uncle, circle = maternal uncle.

Conclusions

Social institutions and conventions would suggest that social status will often be more strongly transmitted between generations on either the patriline or the matriline. The factors favoring stronger transmission on the matriline are the much greater involvement in all societies of mothers in the care and education of children. The greater time investment of mothers in childcare is found in all societies, even those such as in contemporary Nordic countries where gender equality is the most advanced. Thus we would on the human capital interpretation of social outcomes expect a greater maternal than paternal connection in the modern world. However, a countervailing force in earlier times was the greater access of fathers to resources, and professional contacts. Also since in earlier years only fathers had occupations and educational qualifications, the father could be much more of a model for the outcomes of sons. It is thus uncertain whether the paternal or maternal line would better predict social outcomes in any earlier society. But we would expect the paternal effect to be greater in high status groups, and the maternal effect greater in average or lower class families.

What we find with the FOE data, however, is that in 27 out of 31 child outcomes (other than wealth) examined across marriages in the years 1754-1995, the patriline and matriline had a predictive ability for child outcomes that was not statistically distinguishable at the 5% level. In the four cases where the coefficients differed significantly, in three the maternal effect was greater, and in one the paternal effect. Thus for most social outcomes – literacy, age at beginning work, age at leaving schooling, higher education, and occupational status – mother and fathers appear always to contribute roughly equally. The one clear exception is wealth, where always patriline wealth is a much stronger predictor of child wealth than is matriline wealth.

We also show above that the equal strength of the matriline as the patriline in predicting child outcomes implies that matriline characteristics are playing an equal causal role to patriline characteristics in determining child outcomes. If maternal characteristics were correlated with child outcomes mainly because they were just another signal of underlying father characteristics, then the mother coefficients would be weaker than those for the father.

The results suggest, however, that the mechanism of transmission is largely independent of parental time interacting with children. The results reported above are thus consistent with the finding of Clark (2023) that the pattern of inheritance of most social outcomes in England 1600-2022 was consistent with direct additive genetic transmission. Such transmission would imply a symmetry of mother and father predictive effects.

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