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Quantity versus Quality: Household structure, number of siblings, and educational attainment in the long nineteenth century

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Abstract: This paper analyses the quantity-quality trade-off and other household-level influences on educational outcomes of children. Nineteenth and early-twentieth century census micro-data is used, providing material from Western and Eastern Europe, the USA and Canada. This is the time-frame of the demographic transition and the onset of modern economic growth; when the quantity-quality trade-off should be most important. Besides the number of siblings, other household features can be of influence as well, such as the gender composition, the inclusion of members outside the nuclear family and the position of women in the household. We find mixed evidence for the quantity-quality trade-off, as well as positive effects of the presence of (upwards) extended family members and parental, especially maternal, literacy.

Keywords: human capital, fertility, demographic transition, economic history

JEL Codes: J13, I24, N30.

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Education is an important driver of economic development. Moreover, it is an important source of wellbeing, and a key determinant of social mobility (Blake 1981; Breen and Jonsson 2005). Educating women, in particular, has been shown to significantly reduce fertility, as well as having positive effects on a range of other development outcomes (Schultz 1997).

In this context a key question is how the educational level of a child is determined? One model, put forward by Gary Becker (Becker 1960; Becker and Lewis 1973; 1991), is that of the quantity-quality trade-off (QQT), which postulates that parents, given a limited set of resources, face a choice between investing in child quantity (the number of children) or child quality (e.g. education).[1] This model is popular amongst economists, particularly those working on Unified Growth Theory (UGT). The QQT is put centre-stage, as an essential mechanism in the nineteenth and twentieth century shift from a situation of Malthusian stagnation toward sustained growth (Galor and Weil 2000; Galor 2005). Technological innovation during the later phases of the Industrial Revolution is supposed to have raised returns to education (O'Rourke et al. 2013), which made it attractive for parents to have fewer children while investing more in their education. Unified Growth Theory thus models the connection between the transition to modern economic growth and the demographic transition.

In Western Europe the demographic transition occurred over 150 years ago, which means data is hard to acquire for most countries. This makes testing the model challenging, and the empirical findings for more recent data are mixed (Black et. al. 2005, Qian, 2009). However, with the recent surge in large-scale collaborative historical data projects (Ruggles 2012), microdata has become available to test the existence of the QQT using historical data from before, during or directly after the demographic transition of various countries.

Other than the implications of Unified Growth Theory a further two reasons exist for exploring the existence of the QQT in a pre-demographic transition context. The first is that with the advent of compulsory schooling to age 16 or above and high levels of government subsidy for schooling the link between parental fertility decisions and investments in child quality is

[1] In this model, parents derive utility from their children, much like they would from consumer goods. Under budget constraints households maximize utility by investing in a combination of quantity and quality. If we turn to the evolutionary biology literature then pursuing a quality or quantity strategy does not have to be a conscious choice but is rather driven by environmental factors. The environment dictates whether pursuing a quantity or quality strategy will best ensure the passing on of one's genes to the next generation.

interrupted, to some extent. The second is that in a post-demographic transition era fertility in general is much lower, giving less scope for variation in the variable of interest.

This paper, therefore, explores the existence of the QQT in pre-1920 micro-data across a variety of contexts. We define the QQT as the idea that children of families with a greater number of offspring will be less educated than those with lower numbers of offspring. The underlying idea is to see if common denominators can be identified that determine if the trade-off occurs. Additionally, we explore which other determinants of educational outcomes exist at the household level. To the best of our knowledge, this approach has not been applied before, with most historical studies limiting themselves to one country.

One determinant of particular interest is how decision-making power is distributed in the household, with specific reference to the position of women. This could be referred to as a 'gendered' Becker hypothesis: societies with an improved bargaining position for women will exhibit a greater tendency to switch from quantity to quality of offspring. The literature suggests that the relative power of spouses may have an effect on average years of schooling (van der Vleuten 2014). Recently, Diebolt and Perrin (2013) have developed a growth model to show that female empowerment is an important factor in determining fertility and the investment in the education of offspring. The bargaining position of mothers in particular, is thought to have a positive influence on the educational attainment of children and, above all, daughters (Thomas 1990, 1994). Other household members may also be important for decisions regarding children's education. For example, extended family members in the household may also matter, i.e. the presence of aunts, uncles or grandparents (Duflo 2003; Ragsdale 2004).

Overall, we find mixed evidence for the QQT. In some samples we find it while in others we fail to. In order to try and explain when it does and does not occur we turn to a number of country level variables that capture the position of women and economic development. There seems to be a relation between economic development and the likelihood of a QQT existing and its strength. Upward extensions to the household (grandparents) appear to be beneficial for children's enrolment. Indicators of a strong position of the mother, such as literacy or occupational status, can also have a positive effect.

The paper is structured as follows. The next section reviews the literature on the QQT and other household-level influences on fertility and human capital formation. After a discussion of the data and methods, the results are presented. The final section concludes.

Determinants of children's education

Since schooling usually happens at a young age, educational decisions are, to an important extent, determined in the households children grow up in. It is in the context of the household that resources and time need to be reserved for the education of children. In his work on the economics of the family, Becker famously asserted the existence of a quantity-quality tradeoff (Becker 1960, 1991; Becker and Lewis 1973). The QQT, according to Becker, means that parents face a choice between having fewer children, and investing more intensely in the human capital of those fewer children or alternatively, choosing to produce quantity (more children) over quality. Becker has proposed a number of explanations for the choice between quality over quantity and its relation to parental income, including preferences for child quality, increasing opportunity costs of (child rearing) time, and the fact that if parents want to treat their children similarly, increases in quality must apply to all children, thus increasing the price of additional quality at a higher number of children (Becker and Lewis 1973).[2]

Numerous empirical studies have provided support for Becker's models (Hanushek 1992; Rosenzweig and Wolpin 1980; Lee 2008; Downey 1995; Steelman and Powell 1989; see Steelman et al. 2002 for a review).[3] With reduced fertility, human capital investment per child can increase. Many growth models stress the importance of technological development and human capital in stimulating the shift from investments in quantity to quality. Parents are motivated to limit fertility and increase the amount of human capital per child because of the increasing expected returns to education, due to more rapid technological change (Galor and Weil 2000).[4] An alternative explanation is that women will face higher opportunity costs to child rearing if their participation in the labour force increases. Again,

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[2] This is a fairly stringent assumption in the face of variations in the way given children are valued i.e. if younger or male children are treated differently from their siblings. In the absence of strong preferences on child quality and/or income effects the QQT at the individual level would breakdown if not all children are treated equally. This makes a comparative approach, such as the one included in the paper, all the more valuable.

[3] Outcomes of 'quality' are not only educational by nature; they can also be health or social status attainment but in general, in the economic literature, quality has been defined in terms of educational investments (see Carmichael, Störmer and Rijpma 2015 for an attempt to bring together the economic approach with evolutionary biology, where the emphasis of the QQT is more on health and survival).

[4] The benefits here are construed in terms of utility for the parents, not necessarily remittances.

technology plays a role in this by weakening the male strength advantage and thus increasing female labour force participation (Galor and Weil 1996).

While this paper focuses on household influences on children's education, the context these households operate in is also very important. For example, recent research suggests that the introduction of child labour laws substantially increased costs per child, though the enforcement of these laws was not successful in all countries (Doepke and Zilibotti 2005). Compulsory schooling also increased the cost of children, not only because of their forgone potential income, but also because of the costs that accompanied formal education, such as books or travel expenses (Humphries 2010, 319). Compulsory schooling thus put pressure on families to limit their size.

The importance of both education and fertility decline for economic growth and development makes the study of the quantity-quality trade-off especially relevant for developing countries. However, the empirical record on the trade-off in developing countries yields mixed results. For instance, Vogl (2013) looks at micro data for 48 developing countries and finds evidence for changing preferences in terms of the quality and quantity of children. Other results corroborate such findings (Patrinos and Psacharopoulos 1997; Jun 2013; Li, Zhang, and Zhu 2008). In contrast, Angrist, Lavy, and Schlosser (2010) look at Israeli microdata for 1983 and 1995 and systematically fail to find evidence for a trade-off. Several other scholars failed to find a strong relationship (Black et al. 2005; Lu and Treiman 2008; Buchmann and Hannum 2001 for a review).

Historical studies exist that provide evidence for the link between family size and educational attainment, though data requirements make this challenging. Such case studies include Prussia between 1816 and 1867 (Becker, Cinnirella, and Woessmann 2010), England 1700-1830 (Klemp and Weisdorf 2011) , Spain 1900-1920 (Basso 2013) and the Netherlands 1812-1883 (Vandezande, Matthijs, and Kok 2011). The trade-off was also found for a number of different cities, i.e. Antwerp 1846-1920 (Van Bavel et al. 2011), and different cities in Prussia 1875-1910 (Galloway, Lee, and Hammel 1998). Fernihough (2011) studies Dublin and Belfast for 1911 and found a significant effect of sibship size on the probability of school enrolment in both localities. However, Clark and Cummings (2015) fail to find a QQT effect for England between 1750 and 1879. The historical record provides an important testing ground for exploring whether the trade-off occurs. Moreover, to assess the plausibility of UGT, it is important to explore the existence of the QQT in historical societies. Looking at countries during the period in which their demographic transition occurred, could shed light on the determinants of the trade-off.

Besides simply the number of siblings a given child has, the sex of those siblings can also matter, particularly in a situation of son preference. In such a context parents will not limit fertility, but instead keep expanding the family until the desired sex composition is reached. Lee (2008) looks at South-Korea in the 1990s and finds evidence of son preference. Using the sex of the first child as an instrument, he shows the detrimental effect of a larger sibling size on educational attainment.[5] Using historical data, Vandezande and Kok (2011) find that in Netherlands between 1850 and 1920, investment in boys education was no greater than that for girls, measured in terms of their literacy. They do find that older sisters seem to help younger sisters. Once again, contemporary scholarship shows varied results. Some find no evidence of sibship composition affecting the limitation of fertility and educational attainment (Kaestner 1997; Hauser and Kuo 1998), whereas others do (Butcher and Case 1994; Zeng et al. 2012; Yamauchi and Tiongco 2013). In some situations son preference might inhibit fertility limitations, and thus block the shift to investment in quality.

As the above demonstrates the inverse relationship between child quantity and quality is not a straightforward one. Its embedding in different cultural contexts influences its extent or presence. The relationship is confounded when different family attributes are introduced, such as the birth order, the sex ratio of the sibship and whether the family is nuclear or complex. Bras, Kok, and Mandemakers (2010), for instance, find a relationship between sibship size and occupational status attainment for the Netherlands in the period 1840-1925. However they also show that sometimes the impact of a large family on attainment may be neutral or even positive. One of the possible explanations they give for this is the security provided by extended (kin) networks.

Besides siblings, therefore, other extensions of the family might also have an impact on the educational attainment of children. An extended family could include a variety of upward (grandparents) and lateral kin extensions, such as aunts, uncles, but also cousins and nephews or nieces. It is difficult to assess the impact of these additional household members, because co-residence occurs for different reasons. For families with limited resources, doubling-up with other family members provides the possibility of economies of scale and improves the household's scope for division of labour. Grandparents, aunts and uncles can provide childcare or contribute in other ways to the family budget (Duflo 2003; Jamison et al. 2002). Related to this is the 'grandmother hypothesis', the idea that post-

[5] When son preference is present, those families with more daughters in earlier phases of fertility end up with a larger number of children (Lee 2008).

reproductive women positively support the health and education status of their grandchildren (Duflo 2003; Gibson and Mace 2005; Parker and Short 2009). Children from poor families might benefit from these additions to the household because more resources are available. However, when these kin cannot contribute to the household economy, due to age, infirmity, etc., they may act as a drain on resources. In addition, the inclusion of lateral extensions such as cousins, nephews and nieces may drain household resources. Globally as well as historically, families and households come in a wide variety of forms. The question arises whether different patterns of co-residence will have different effects on the educational outcomes of their offspring.

Women bear the bulk of the opportunity costs of fertility, which might result in a disparity in fertility preferences within the household. Diebolt and Perrin (2013) use this idea to develop a growth model that suggest that the position of women within the household matters for the shift from quantity to quality. Studies from development economics also indicate that differences in female bargaining power within the household might be a fruitful factor to explore further, as various studies show that the household position of women directly impacts fertility behaviour (Mason 1987; Jejeebhoy 1995; Alvarez 2011). A substantial literature on household bargaining power underlines the importance of resource distribution and the relative position of household members in resource allocation. It has been shown that, relative to men, women tend to favour children in their resource allocation behaviour (Handa 1994; Hoddinott and Haddad 1995; Thomas 1990, 1994; Thomas, Strauss, and Henriques 1991; Doss 2012). A stronger position of women in the household can thus positively influence children's education.

Moreover, a stronger position for women in the household allows women to build their own human capital stock. In turn, women with higher human capital are better able to negotiate the limitation or postponement of fertility (Jejeebhoy 1995). Maternal education has been shown to have a positive impact on children's nutrition and health (Behrman and Wolfe 1989; Glick and Sahn 2000; Schultz 1993), thus lowering child mortality rates. The relationship between mother's and children's education seems to be more robust than that of father's education. There is historical evidence to support the above premises. For Prussia between 1816 and 1867, Becker, Cinnirella, and Woessmann (2010) show the link between women's education and their fertility before the demographic transition and find a strong negative effect. Baizan and Camps (2007) look at the effects of female education and professional achievement on fertility decline in Spain over the period 1920-1980, and find that women's education had a very significant impact on fertility decline. A strong position of women in the household seems, therefore, to be conducive to higher resource allocation towards children.

To test the position of women within the household with limited historical data, marriage patterns can be used as an indicator. Delayed marriage – which coincides often with the delayed onset of childbearing – is associated with decreased fertility and greater human capital investment (Field and Ambrus 2008). A small spousal age gap – the age difference between husband and wife – may indicate a situation with relatively high female bargaining power compared to a marriage where girls are married to men many years their senior (Carmichael 2011; Carmichael, De Moor and Van Zanden, 2011).[6]

On the basis of the above we formulate the following hypotheses. First, we expect sibship size to be inversely related to educational attainment, meaning that a higher number of siblings within a household will be associated with a lower likelihood that children will be enrolled in school, or less literate. Second, the sex composition of a set of siblings may inhibit the QQT in a situation of son preference. We therefore explore whether the number of sisters or brothers have different effects on educational outcomes, and whether being male increases or decreases the chance of being enrolled. Third, we expect that a stronger female position, as indicated by a lower spousal age gap or mother's educational attainment, will lead to higher educational investment per child and lower fertility. Lastly, we hypothesise that the presence of extended kin within the household can either be detrimental or beneficial to educational attainment of children.

Data

To explore these issues, micro-data is needed. After all, decisions about education and fertility are taken at the level of individuals or households (Guinnane 2011). To this end, we use census micro-data. This is not the ideal data with which to study the QQT. To test the sort of hypotheses we set out above, longitudinal microdata (life-course or family reconstitution data) with completed fertility would be best suited. This can show exactly how many children a couple had, rather than merely showing how many children were present at the time of the census. Moreover, longitudinal data can

[6] It must be kept in mind, though, that the majority of our datasets come from regions west of the Hajnal line so might not provide enough variation in order to say anything meaningful about this. The literature cited here use data at the level of the region or country where different mechanisms may be at work than at the microlevel.

provide a range of outcomes to measure child quality. Besides outcomes such as literacy, longitudinal data can provide information on status attainment at a later age (conditional on parental status attainment), thus giving much more encompassing information than the snapshots of a census.

There are examples of historical, longitudinal microdata (an overview of the possibilities of historical microdata can be found in Ruggles 2012). However, they are of a far more limited number than the micro-census data we use here. While census microdata does not allow for the same detailed analysis of fertility as longitudinal data, its wider availability means it is possible to include a much broader sample of countries. The data used here therefore allows us to look at a far wider range of national contexts, thus giving a bird's eye view of in what contexts the QQT occurs. This would not be possible with longitudinal data.

The aim of this paper is thus to bring together as many examples of pre-1920 census data at the microlevel as possible in order to test the QQT in a range of societies. At the very least, we require microdata which gives information on household size and a measure of education of the children.

We have used complete or sampled census data or similar for Ireland, Canada, the USA, Scotland, England and Wales (Minnesota Population Center 2008; National Archives of Ireland 2014). We have further used micro level data for towns or regions in Serbia, Germany, Italy, Austria, Albania and Switzerland. The data covering towns or regions in central and Eastern Europe has been collected from the data releases of the MOSAIC project which aims to make available comprehensive census micro-data sources for Europe and beyond. An overview of the data we have used from MOSAIC is presented below.

Table 1a. Regional datasets.

sample	year	sample % original	nhh	hh analysed
mos-rostock-1867	1867-1867	100	6748	1701
mos-san_marcello-1827	1827-1827	100	278	72
mos-kruja-1918	1918-1918	100	1361	381
mos-rostock-1900	1900-1900	100	14144	3697
mos-jasenica-1884	1884-1884	100	1474	674
mos-zurich-1870	1870-1870	100	1537	364

The other data we use comes from a variety of sources. Most importantly, they come from the North Atlantic Population Project (NAPP) website which, similarly to MOSAIC, aims to provide historical micro-data for Great Britain, Germany, Iceland, Norway, Sweden and the United States from 1801-1910. The table below presents an overview of the data used for this paper.

Table 1b. National datasets used for the current version

sample	year	sample % original	nhh	hh analysed
mos-hungary-1869	1869-1869	0.3	6572	1059
mos-austria-1632_1947	1632-1947	unknown	26370	4247
mos-austria-1910	1910-1910	unknown	4124	363
arch-ie-ireland-1911	1911-1911	5	36558	7475
arch-ie-ireland-1901	1901-1901	5	35094	7612
napp-scotland-1881	1881-1881	100	73708	13588
napp-englandwales-1881	1881-1881	100	53252	9756
napp-great_britain-1851	1851-1851	2	7802	2939
napp-usa-1860	1860-1860	1	53830	19336
napp-usa-1850	1850-1850	1	37010	13605
napp-usa-1870	1870-1870	1	78703	27138
napp-usa-1880b	1880-1880	10	116852	53919
napp-usa-1900	1900-1900	5	82523	35738
napp-usa-1910	1910-1910	1	217622	62100
canfamilies-canada-1901	1901-1901		51774	14525

Typically, the census micro-data is organised by enumerating each individual or a sample of individuals in a country or region. In the censuses employed here, each individual's place in their household is also provided. This is done by specifying the relation to the household head (e.g. son, wife, or mother of the household head). In addition, the occupation, age, ethnicity, schooling, and religion of each individual may be reported (although this is not always consistently available). Micro-data lacking any data on the relation to the household head or schooling were disregarded.

While some of the data was already integrated and processed (the NAPP data and some of the Mosaic data, see below for more detailed description), other data required substantial cleaning before it could be used (e.g. Ireland). Moreover, all data needed to be harmonised so that we could be sure that the analysis for each sample was as similar as possible. After all, if we want to say something about differences in countries regarding household structure and educational outcomes, the data should be as comparable as possible. Otherwise we increase the risk of attributing differences to country characteristics while they are actually caused by differences in the coding of the data.

Enrolment was gathered either from occupational information or from a variable directly reporting enrolment (the USA and Canadian samples). Wherever it was available we also used literacy as a robustness check. In many cases the enrolment data had to be obtained from the literal transcription of the occupation, which meant that a lot of spelling variations had to be accommodated (in the case of Ireland this held for the literacy data as well). String distance packages using Jaro-Winkler distance (Van der Loo 2014) were used to facilitate this. Sometimes the procedure was used for the coding of occupations, the relation to the household head, sex, and religious affiliation. These and other variables were harmonised to a more manageable number of possibilities.

It was also important to have information on whether or not the household was in an urban location. Often this was already coded in the micro-data; in other cases the data was matched to the extended database on city sizes of Bosker et al. (2014). The data was also geocoded at the country level to be able to combine it with country-level data. Additionally, geocoding was occasionally done at the village level to be able to cluster villages for regional controls that covered enough observations.[7] Finally, it was necessary to create identifiers for households and persons. In most cases this was already done in the micro-data, but in some cases this information had to be derived from information on the address and the relation to the household head.

An additional step was made to exclude unreliable or unrepresentative observations. This was particularly pertinent for households which had multiple heads of households. These turned out to often be larger scale institutions (think poor houses, orphanages, boarding schools) and would thus skew the results as they would show a large number of children going to school. In order to ensure that these observations were excluded from the dataset we followed the NAPP-definition of an institution and dropped such households with 10 or more members unrelated to the head.

[7] Google's geocoding API was used to geocode villages:
<https://developers.google.com/maps/documentation/geocoding/>.

With the data harmonised, it still needed to be reshaped to get household-level observations for each variable. For each child, observations were created on the number of siblings, brothers, sisters, servants, extended and lateral household members, whether there were twins in the household, and the birth order of each child. Moreover, all available relevant parental information (occupation, literacy, religion, ethnicity) was added. From this, the spousal age gap and the implied age of the mother at first child were calculated.

A final step was the selection of relevant cases. If schooling was mandatory for children of a certain age, we should not expect there to be much variation in their enrolment. Also, in the case of mandatory schooling the mechanism is no longer one of parental choice for investments in quality over quantity. For this reason we collected data on the age to which school was mandatory in the various countries considered (table 2). We then only looked at the enrolment (and literacy) of children older than this, yet below age 16.

sample	iso3	year	age
mos-austria-1910	AUT	1910	12
mos-austria-1632_1947	AUT	< 1774	5
mos-austria-1632_1947	AUT	1774–1869	12
mos-austria-1632_1947	AUT	1869–1947	13
napp-canada-1891	CAN	1891	13
canfamilies-canada-1901	CAN	1901	13
mos-hungary-1869	HUN	1869	11
arch-ie-ireland-1901	IRL	1901	13
arch-ie-ireland-1911	IRL	1911	13
mos-jasenica-1884	SRB	1884	5
mos-kruja-1918	ALB	1918	5
napp-usa-1850	USA	1850	5
napp-usa-1870	USA	1870	5
napp-usa-1880b	USA	1880	5
napp-usa-1900	USA	1900	5
napp-usa-1910	USA	1910	5
mos-rostock-1867	DEU	1867	5
napp-englandwales-1881-1pc	GBR	1881	12
napp-great_britain-1851	GBR	1851	5
mos-rostock-1900	DEU	1900	5
mos-san_marcello-1827	ITA	1827	5
napp-scotland-1881-10pc	GBR	1881	12
mos-zurich-1870	CHE	1870	5

Table 2: mandatory schooling ages.

We also constrained the data so that the age of the mother at the time of the census was between 18 and 49. The implied age of the mother at birth of first child was calculated by subtracting the age of the oldest child from her age. If this age was implausible (14 or lower), implying for example that some of the children were from a previous marriage of the household head, the observations were dropped.

As mentioned above, an issue with census data is that it rarely provides information on completed family size, let alone intended family size. While longitudinal data may provide the former, the latter is the exclusive realm of modern-day surveys. We nonetheless think that an analysis of the QQT using census data is valuable due to its broad historical coverage. However, it is necessary to control for the possibility that children have already left home or that a couple is at the start of their reproductive career we include the implied age of the mother at first birth. At low ages of mothers at first birth, the household may not yet be completed. The high implied ages at first birth, it is more likely that some of the siblings have already left the household. The summary statistics also provides figures on the singulate mean age at leaving home (Steckel 1996) to assess any differences in this regard between the samples.

It is important to consider issues that might arise due to any biases in sibship size. Note first that, on average, we would still expect households where the parents intend to have many children to show up in the census with more children. Any bias in the estimates, if the QQT exists, would be upwards (closer to zero): children with many siblings might have more siblings than we observe they do. The lower the average age at leaving home in society is, the larger this bias would be.

A further issue, due to the fact that we measure sibship size inaccurately, is the introduction of noise. This means we need a large number of observations to measure the effect of sibship size on educational outcomes. Finally, looking at the number of children present in the household has some advantages over looking at completed sibship size. In a situation where saving or borrowing is difficult, competition for resources is mostly between children present in the household, not those that have left the household.

A different issue is that we possibly underestimate the amount of enrolled children in some cross-sections because of how they were recorded. Some datasets provide information directly about the enrolment of children. Others provide information on school enrolment as reported in the occupational status. In the latter, we frequently find no occupation reported, and this under-registration seems to vary by country and by individual census taker. Similar issues of occupational under-reporting arise in defining women's occupational status, which in our datasets is seldom reported. The under-reporting of married women's work in censuses is a recurring issue that all scholars face in working with census data and has been addressed as such in the literature (Humphries and Sarasúa 2012; Schmidt and van Nederveen Meerkerk 2012).[8]

Lastly, the classification of occupations differs per data source. Some of the NAPP and Mosaic data classifies occupations using OCCHISCO, which we aggregate to control for occupation. The US censuses also report imputed incomes for occupations, which were preferred as a control over occupational dummies when they were available. Likewise, the UK censuses provide occupational status scores for the occupations which were also preferred over the dummies. Others lack such structuring of the data, in which case we assigned dummies to the most frequently occurring occupations. Tables 3 and 4 present summary statistics. Table 3 shows descriptive statistics for the entire dataset whereas table 4 presents a number of variables specifically for the sample we used in each case.

[8] The under-registration of women's work in the 19th century can be interpreted as the official outlet of the ideal of the male bread-winner family, prohibiting married women participating in the labour force (Humphries and Sarasúa 2012; Schmidt and van Nederveen Meerkerk 2012).

Table 3. Summary Statistics for total datasets

Country	Sex ratio total	Population under 20	Mean age	Female SMAM	Male SMAM	Mean age at leaving home	Spousal age gap
Hungary 1869	0.98	0.48	24.4	20.95	25.82	18.04	4.87
Rostock 1867	1.04	0.37	28.28	28.23	30.37	16.84	2.14
San Marcello 1827	0.97	0.33	30.73	26.68	27.9	18.61	1.22
Kruja 1918	0.96	0.44	26.97	18.75	27.41	16.66	8.66
Rostock 1900	1.17	0.38	29.18	25.24	27.25	17.45	2.01
Jasenica 1884	0.97	0.53	21.06	19.55	22.87	17.76	3.33
Zurich 1870	1.34	0.31	30.08	29.09	30.07	16.88	0.97
Austria 1632-1947	1.06	0.38	30.91	28.73	30.96	16.98	2.23
Austria 1910	0.97	0.41	29.11	27.59	31.3	17.41	3.72
Ireland 1911	0.99	0.39	30.3	29.03	32.93	18.31	3.9
Ireland 1901	1.01	0.42	28.46	28.65	32.42	18.34	3.77
Scotland 1881	1.04	0.53	23.19	26.6	28.46	18.23	1.85
England and Wales 1881	1.05	0.52	23.12	26.03	27.2	18.29	1.16
Great Britain 1851	1.03	0.5	23.75	26.65	28.12	17.72	1.47
Great Britain 1851	1.03	0.5	23.75	26.65	28.12	17.72	1.47
USA 1860	0.96	0.51	22.68	NA	NA	18.88	NA
USA 1850	0.96	0.52	22.29	NA	NA	18.76	NA
USA 1870	0.99	0.5	23.47	NA	NA	18.79	NA
USA 1880	0.96	0.54	22.23	23.96	27.72	18.96	3.76
USA 1900	0.95	0.5	23.7	24.5	28.5	19.35	4.01
USA 1910	0.95	0.42	26.63	23.08	26.8	19.04	3.71
Canada 1901	0.95	0.45	26.26	25.45	28.68	19.51	3.23

Table 4 Summary statistics for analysed data

Country	N children	N households	Mother age first child	Lateral Extensions	Upward extensions	All extensions	Servants	Households with twins
Hungary 1869	1304	1059	23.08	0.02	0.03	0.05	0.09	0.03
Rostock 1867	3236	1701	26.53	0.03	0.04	0.07	0.32	0.03
San Marcello 1827	139	72	23.15	NA	NA	0.22	0.36	0.04
Kruja 1918	689	381	25.81	0.35	0.35	0.49	0.07	0.02
Rostock 1900	6862	3697	25.13	0.03	0.07	0.1	0.03	0.02
Jasenica 1884	1380	674	21.91	0.26	0.14	0.32	0.04	0.07
Zurich 1870	677	364	25.77	NA	NA	0.15	0.62	0.02
Austria 1632-1947	6590	4247	25.09	NA	NA	0.1	0.42	0.05
Austria 1910	461	363	25.02	0.11	0.08	0.18	0.19	0.06
Ireland 1911	19680	7475	25.67	0.09	0.08	0.15	0.11	0.03
Ireland 1901	20931	7612	24.53	0.08	0.08	0.15	0.12	0.03
Scotland 1881	16703	13588	23.96	0.06	0.04	0.1	0.11	0.04
England and Wales 1881	11908	9756	23.91	0.06	0.05	0.1	0.10	0.03
Great Britain 1851	7143	2939	24.59	0.07	0.05	0.11	0.18	0.03
Great Britain 1851	7143	2939	24.59	0.07	0.05	0.11	0.18	0.03
USA 1860	44344	19336	22.52	0.06	0.06	0.11	0.05	0.04
USA 1850	33883	13605	22.37	0.07	0.06	0.12	NA	0.05
USA 1870	62485	27138	22.68	0.05	0.07	0.11	0.06	0.04
USA 1880	134181	53919	22.33	0.09	0.07	0.15	0.14	0.04
USA 1900	88658	35738	22.69	0.08	0.08	0.15	0.08	0.05
USA 1910	132532	62100	22.98	0.07	0.07	0.13	0.06	0.03
Canada 1901	32791	14525	23.62	0.06	0.08	0.12	0.08	0.03

Method

The basic estimation strategy is captured in the equation below. The outcome variable is a binary enrolment variable (1 if a child is enrolled, 0 otherwise) of a child i in household j. The analysis is restricted to children at ages when education is no longer compulsory, but below age 16. When available, literacy is used as an alternative outcome variable (see appendix). To test for the existence of a quantity-quality trade-off, the main predictor variable of interest is the number of siblings. A negative coefficient on the number of siblings-variable would indicate the presence of a quantity-quality trade-off.

$$enrol_i = \beta_0 + \beta_1 nsib_j + \boldsymbol{\beta X} + \epsilon$$

This model is estimated using logistic regressions with standard errors clustered at the household level. A number of robustness checks and alternative models were estimated using OLS regressions, again clustering standard errors at the household level. In the results section we mainly discuss estimates for data and regressions that are fully harmonised. This means the data is coded identically and the model specification is the same across all samples. However, this does imply that we cannot include all relevant information in the regressions. For example, the US censuses do not report religion, so we could not control for this in the harmonised regressions. We have included such information in the most complete models in the appendix.

A number of further variables, $\boldsymbol{X}$, are included as controls and to investigate other hypotheses. First, we control for birth order as it has been found that this might influence the QQT (Hanushek 1992; Black et al. 2005). Including birth order effects can also pick up investments in specific children, such as the oldest child. Variables that measure the number of relatives present in the household that are not part of the nuclear family are also included. This includes both upward and lateral (uncles, aunts) extensions of the household. Some censuses only provided data on whether members of the household were nuclear or other relatives; in this case we have only used a variable measuring the number of extended household members.

Two variables are included to investigate the importance of maternal authority on children's education. First, the age difference between husband and wife (the spousal age gap) was used to check if the relative position of a wife vis-à-vis her husband captures relative maternal authority effects in regards to education. Second, where available, the literacy of the mother and the father are included as well.

It is important to control for household income as increased resources would allow parents to increase both the number of children and their quality (Becker and Lewis 1973; Galor 2011). Another way household resources matter is because they could alter the need for children's income or labour. In the complete (unharmonized) models in the appendix, parental occupational dummies are included as a control for household income. However, since occupations are only a crude approximation of income and sometimes even this information is not available, we followed Fernihough's (2011) approach by creating a variable on the number of servants present in the household. Servants were still very common in the nineteenth century and allow us to make a crude distinction between the richest deciles that could afford servants and the rest.[9] Finally, in the unharmonised regressions in the appendix we include parental occupations and as many further controls as the data provides: parental religion, parental race, parental ethnicity, and regional dummies (the exact definition of a region varies by sample).

A separate model is also estimated where the number of siblings is replaced by the number of brothers or sisters to check for gendered effects. This tests whether the number of brothers or sisters has a different effect than the overall number of siblings. Thus, this can show whether having a largely female or male sibling set influenced educational attainment. Dummies for sex of the child itself are also included and have a similar purpose.

The model above might have endogeneity issues (omitted variable bias related to household income and simultaneity bias are especially important here). For the estimation of the QQT using microdata, instrumental variable techniques using the occurrence of twins has become standard practice (Rosenzweig and Wolpin 1980). The occurrence of twin birth increases sibship size (it is a relevant instrument) and its occurrence is random (it meets the exclusion restriction), making it a seemingly perfect instrument.

$$enrol_i = \beta_0 + \beta_1 nsib_j + \boldsymbol{\beta X} + \epsilon$$
$$nsib_j = \gamma_0 + \gamma_1 twin_j + \boldsymbol{\gamma X} + \upsilon$$

[9] In our samples, between 3% (Rostock, 1910) and 62% (Zurich 1870) of the households have servants. See also the summary statistics in table 4.

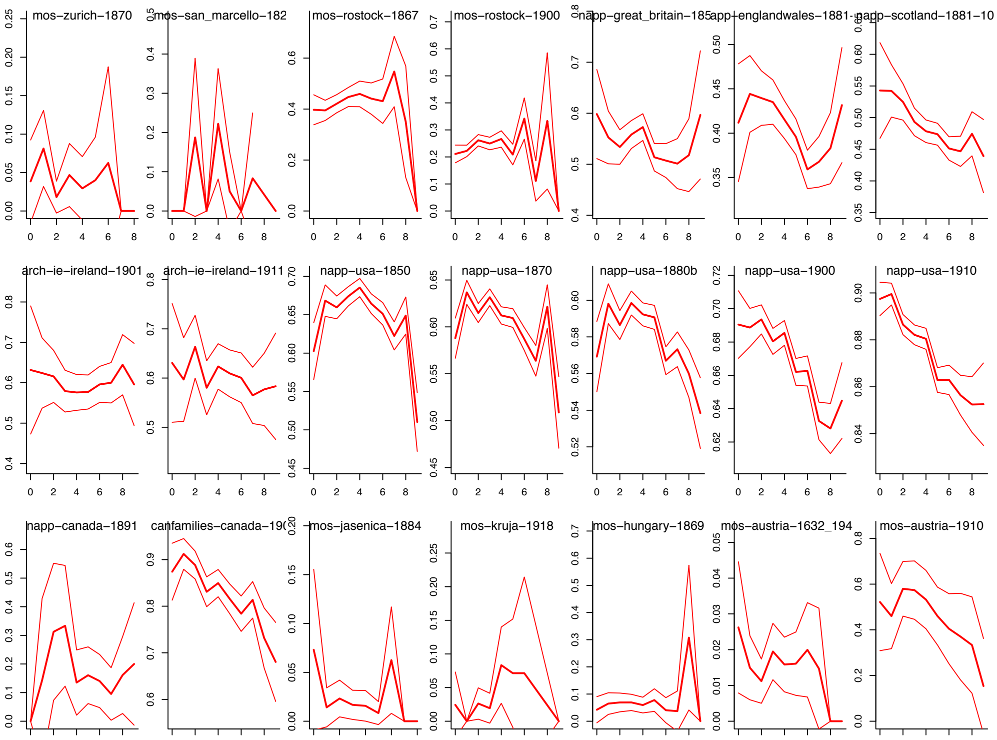
Two caveats must however be mentioned. First, twins often have low birth weight, which may lead parents to lower their investment in them because they expect their survival chances to be lower (Rosenzweig and Zhang 2009). In turn, such early-childhood disadvantages may have consequences for educational outcomes later on (Currie 2009). This direct effect on the outcome variable would mean that the instrument would fail the exclusion restriction. Secondly, most of the censuses do not allow us to identify twins perfectly; there is a possibility that some of them are two children born within the same year to the same mother. Another possibility is that the census misreports ages due to age-heaping, making it more difficult to identify twins. As a check we provide the number of twins in our sample (see the summary statistics in the appendix) to see whether the figure is not too far from the natural share of twins in a society, which should be around 3–4 %. Lower figures can be explained by higher mortality among twins, but higher figures indicate that too many children in the data are identified as twins. The sample for Jasenica in Serbia shows a very high number of twin children (seven per cent). This is probably due to the prevalence of age heaping in this census (Whipple index > 200).

Results

This section mainly discusses the results of the harmonised logit regressions, regressing enrolment on the number of siblings, the sex of the child, the child's age, the child's birthorder, the number of servants in the household, the spousal age gap of the parents, the implied mother's age at first child, and whether the household is in an urban location. More elaborate regression models can be found in the appendix.

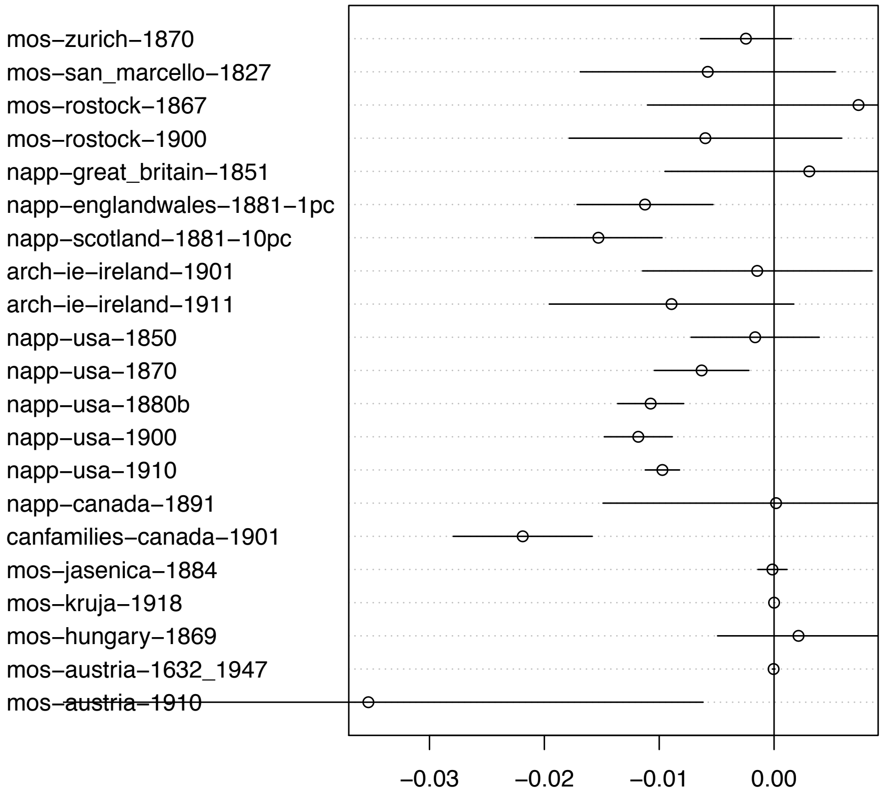
We start by presenting graphs of enrolment against number of siblings for each of our 21 samples with the 95% confidence interval included (figure 1). These results highlight visually what we find below, i.e. that a QQT cannot be established for all samples. Visually it is also clear that the US samples show a tighter relationship between the two, with smaller confidence intervals, than the other samples.

Figure 1: Graphs of average enrolment by number of siblings (nsib) for 21 samples.



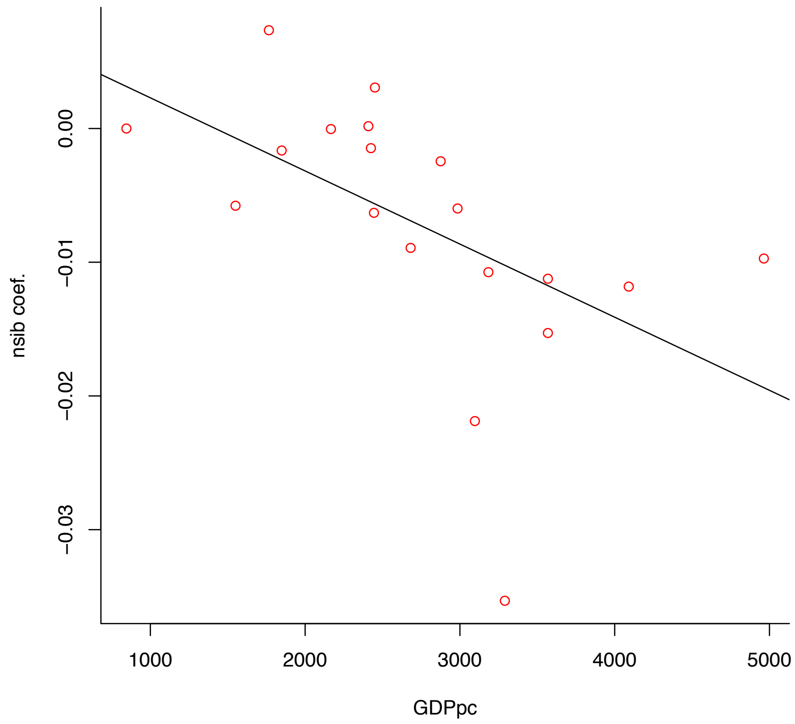
The coefficients on the number of siblings in the harmonised regressions with 95 per cent confidence intervals are presented in figure 2 below. The coefficients reported here are the marginal effects for the logit regressions. Looking at the results we find evidence for a quantity-quality trade-off in roughly half the samples, many of which are for US data. The coefficients found are around −0.01. This means, that even if we generously take the difference between a large and a small number of siblings to be five children, this only increases the chance of being enrolled by 5 per cent. It could be argued that over generations this effects adds up, but at the same time it does suggest that in understanding human capital accumulation, sibship size is not the only things that matters.

Figure 2. Coefficients on number of siblings for all samples.



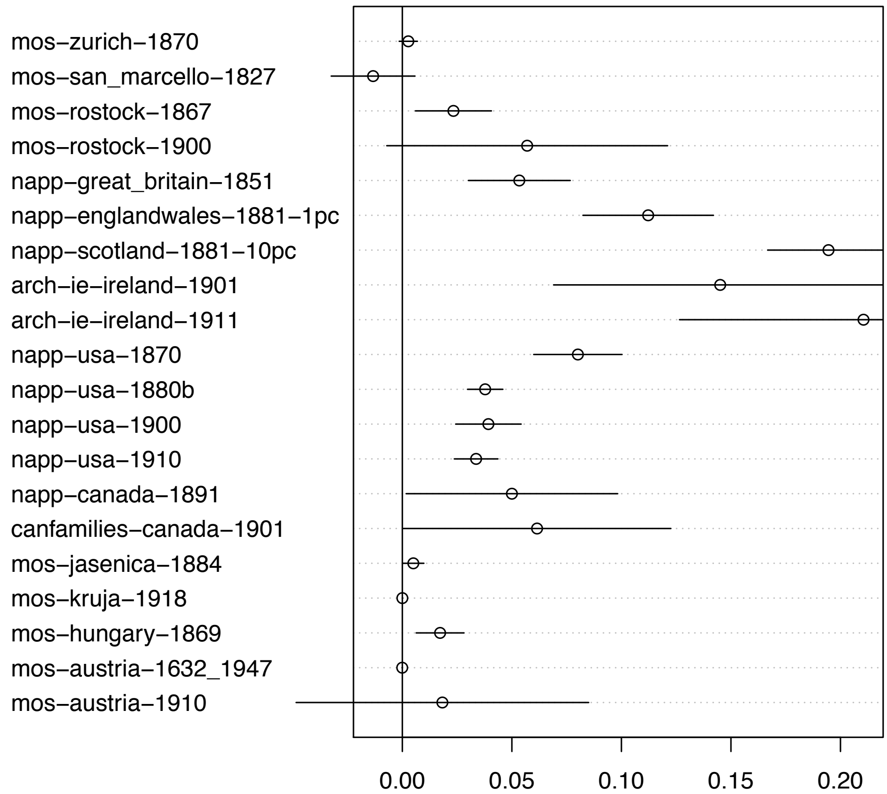
The varying and weak effect of sibship size is to an extent an unexpected finding. While we do expect variation in the society-level results of the tradeoff (the extent to which individuals in a given society choose quality or quantity), we would generally expect to find the trade-off at the household level. At the household level, in turn, the trade-off is a fairly simple mechanism. Even if one does not believe fertility is consciously controlled to the end of investing in children, it would still be the case that having fewer children would free up resources to invest in the remaining children (Lucas 2002; see the conclusion for a brief discussion). Income is of course only imperfectly proxied by the number of servants in the household (or occupational controls in the full models reported in the appendix). It is interesting to note that for the countries where we have multiple datasets for a number of different years there is one almost universal result – the coefficient on the number of siblings becomes increasing negative over time. This can be observed for the Great Britain in 1851 compared to England & Wales, and the Scottish sample in 1881. Similarly Rostock, Ireland and Canada show the same sort of results. The US coefficients increase from 1850-1900 after which they dip slightly.

Figure 3. GDP/capita (1990 $GK) against the coefficient on the number of siblings.
Source: Bolt et al., 2014



The increasing effect over time suggests that the strength of the QQT may be tied to economic development. Figure 3 plots GDP per capita of each country included here for the year the observation is for against its corresponding coefficient on number of siblings. On the basis of the graph there does indeed seem to be a relation between GDP per capita and the strength of the QQT. Countries with a higher income are more likely to have a QQT and typically a stronger QQT.

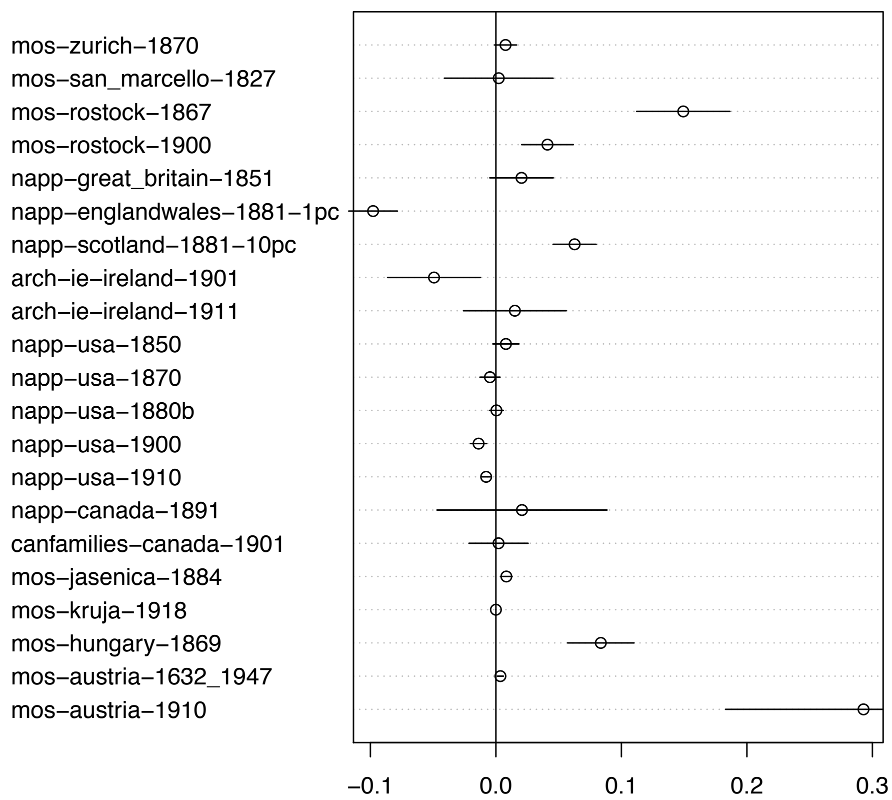
Figure 4. Coefficient on dummy variable for servants.



On the micro level we capture wealth with a dummy variable for servants and the following figure shows that here we find a majority of significant, positive effects, suggesting that the number of servants indeed captures the resources households had to send children to school. Zurich, San Marcello, Kruja, Jasenica, and Austria are the clearest examples of samples that do not adhere to this general pattern, having either a 0 coefficient or negative relationship with school enrolment (although no sample has a significant negative coefficient on this variable). Our samples for Kruja and Jasenica have two of the lowest percentages of households with servants (7 and 4 percent respectively – see table 4, summary statistics). As samples from Eastern European countries this is likely driven by the reduced importance of life-cycle servitude in these economies, which might means that we are not capturing the same sorts of households with this variable as we do in the other samples. Meanwhile Zurich stands out for having 62% of households in our sample with servants, the highest percentage by far. Again this may indicate that in Zurich households with servants are different from those in the other samples. The aspect of change over time in the countries for which we have multiple years of data paints an inconsistent picture. In the US the coefficient on servants gets smaller over the period for which we have data, while for the UK between the 1851 and the 1881 samples there is a substantial increase on the coefficient on servant.

Next we move on to explore gendered effects, in this way attempting to test the gendered Becker hypothesis. Little difference between the number of siblings and the number of brothers and sisters on enrolment could be found.[10] The following dotplot presents the coefficients on the variable male, capturing whether samples display preferences for educating boys over girls.

Figure 5. Coefficients on male for all samples.



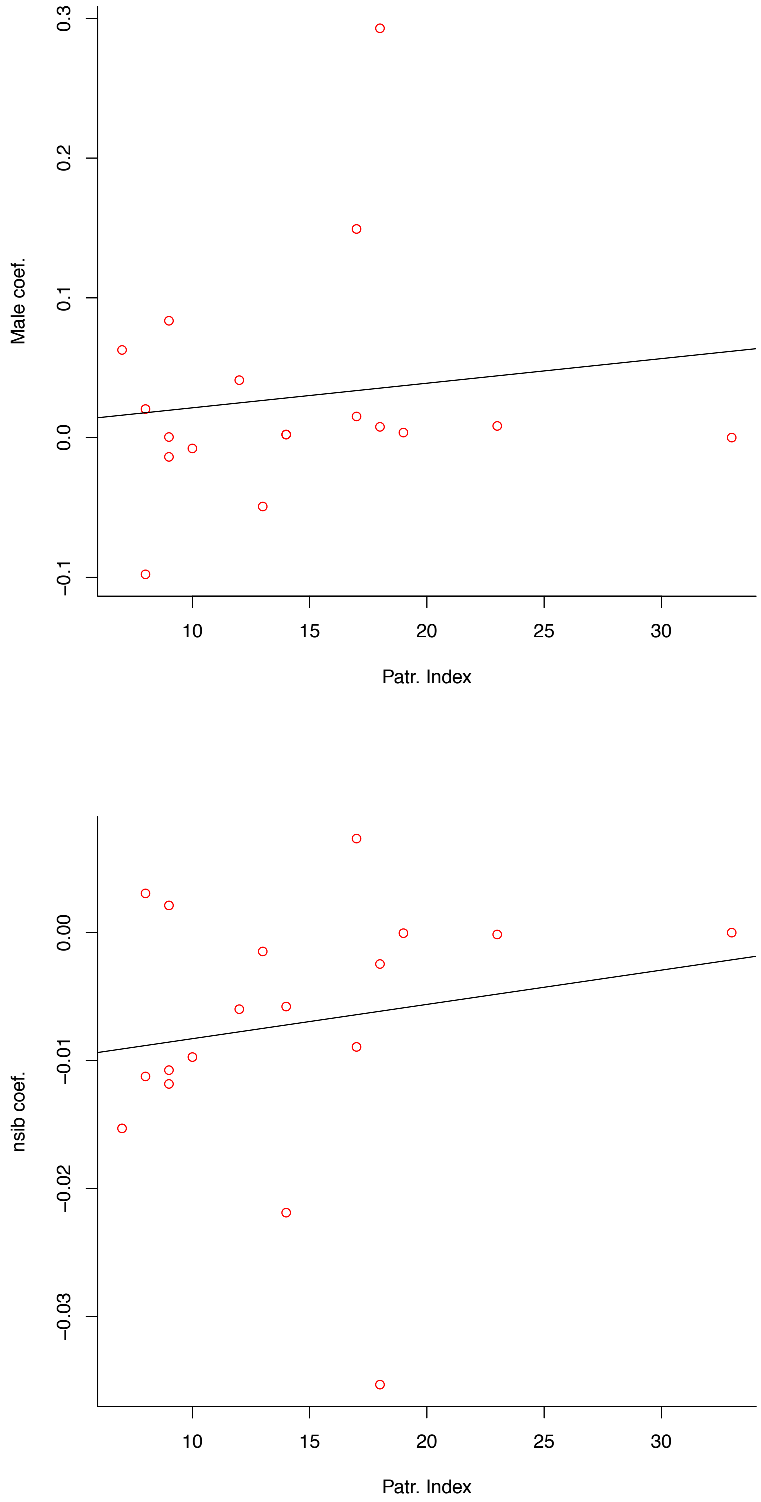
[10] See appendix for this dotplot.

Figure 5 shows that boys were often more likely to be enrolled than girls. It is interesting to observe that this is not the case for the USA, England and Wales in 1881, and Ireland in 1901. These countries exhibit a negative coefficient on male meaning that girls are more likely to be enrolled than boys. One interpretation for this could be that boys have greater labour force opportunities at younger ages, leaving girls behind in formal educational institutions.

Next we explore how our coefficients on the number of siblings and on the male dummy correlate with an aggregated indicator of patriarchal practices which can be derived from microdata. Therefore in figure 6 the patriarchy index (Gruber and Szołtysek 2014) was graphed against the coefficients on nsib to see if we can say that more patriarchal societies are less likely to enrol girls.[11]

[11] Note that we calculated our own index using their method, rather than directly using Gruber and Szołtysek's patriarchy-index results because our samples are not identical. The index is made up of a male dominations cluster (lack of female headed households, lack of wives older than husbands, high numbers of child brides and low numbers of female non-kin resident), a generational domination cluster (old laterals and old joint families, low nuclear family percentages and high old men resident percentages), a patrilocality cluster (low numbers of married daughters living at home with parents) and a son preference cluster (ratio of last child son high and sex ratio 0-5 skewed towards boys).

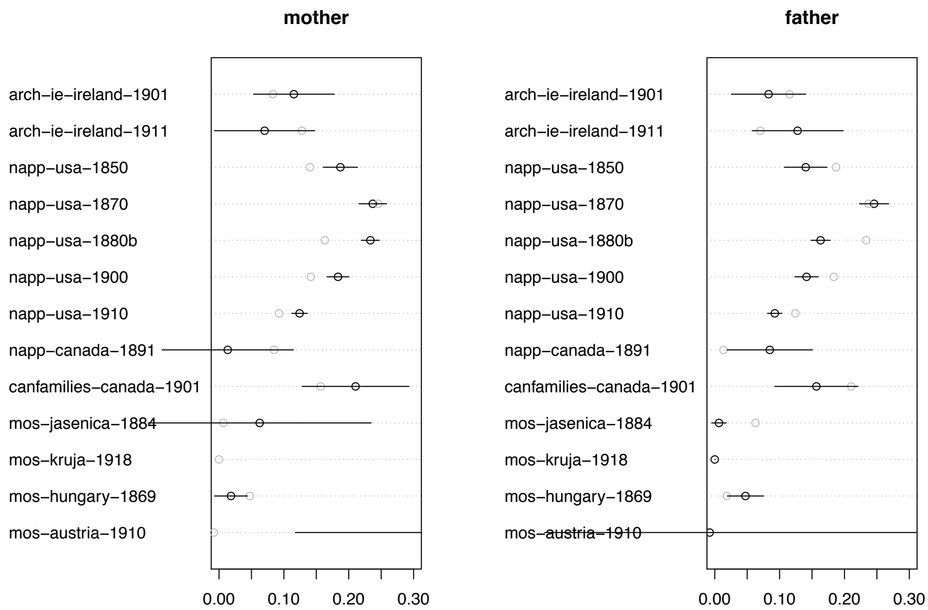
Figure 6. Coefficients on male and number of siblings against the patriarchy index.



A slight positive relationship appears to exist between the patriarchy index and the coefficient on male as well as between the patriarchy index and the coefficient on the number of siblings. This is what we would expect to find, that in patriarchal societies investment in the education of males is greater relative to females. This, in turn could interfere with the functioning of the QQT. However the result for the coefficients on male seems to be being largely driven by the Austria 1910 sample, which had a very high and significant coefficient on male. The relationship between the patriarchy index and the number of siblings coefficients suggest that less patriarchal societies are more likely to have a quantity-quality trade off, however this relationship is far from perfect. Two of the countries scoring below 10 are Hungary and England and Wales (1851), however they both also have a coefficient on number of siblings which is indistinguishable from zero. The correlation again seems to be largely driven by two outliers in the bottom left of the plot. These two observations are Canada (with a coefficient lower than –0.02) and Austria (with a coefficient below –0.03).

Spousal age gap usually has no significant effect (see appendix). The exception is the United States where the effect is negative: a larger spousal age gap, indicative of a weaker bargaining position for women, is associated with a lower chance of children being enrolled. In Britain in 1881, the opposite effect is found. Overall, the prediction that female empowerment, as measured by the spousal age gap, would affect children's education is not borne out. The results for our other measure of the status of mothers, mother's literacy is presented below, alongside father's literacy.

Figure 8: Maternal and paternal literacy coefficients.

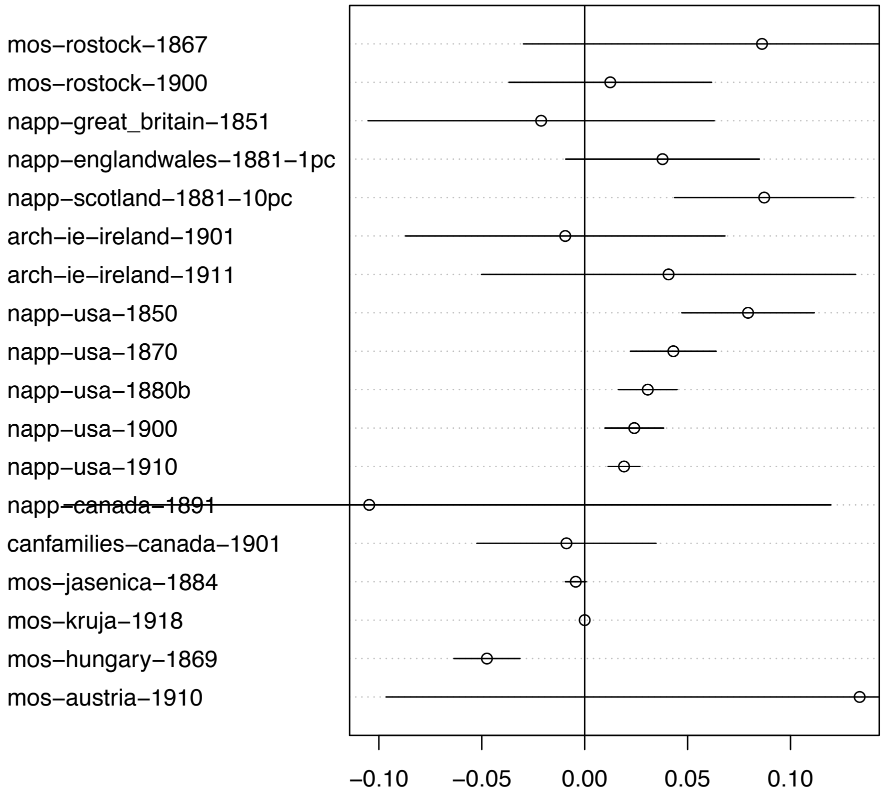


There are interesting differences to note between paternal and maternal literacy (as well as paternal and maternal occupation and occupational status/income). Generally, these variables have large effects. The impact of maternal literacy tends to be higher than paternal literacy. This provides indirect support for Diebolt and Perrin's (2013) model. Not only do they suggest that maternal human capital can be an input in children's education,[12] their model also shows that human capital increases the opportunity cost of rearing children by raising women's income and labour force participation.

These various tests suggest some evidence for the validity of the Gendered Becker Hypothesis but the results for the spousal age gaps and the weakness of the patriarchy index correlation undermines this to some extent. Data on the occupational status of mother's would provide an interesting additional check, unfortunately occupational statuses for women are notoriously under-recorded in historical data meaning this is unrealistic with our current data.

[12] This is only support for their thesis in the broadest sense as their work suggests that parents educate their children themselves or improve the efficiency of education and we cannot test this here.

Figure 7. Coefficients on upward extensions of households.



Next we move to look at how different extensions of the household influence the chances of enrolment. Figure 7 present the coefficients for upward (that is, multi-generational households). The number of upward extensions to the household tends to have a positive effect on enrolment, significantly so in Britain and the United States. This provides support for the grandmother hypothesis, that having a grandmother in the household increases the chance of schooling of the children, although here no distinction is made between grandmothers and grandfathers. Negative effects were, however found in Jasenica and Hungary. If any significant effect can be found at all for lateral kin, it is that their presence in the household was associated with a lower probability of children being enrolled.[13]

[13] Figure available upon request; see also the results in the appendix.

Conclusions

The overall conclusion of this paper is that, when it comes to investments in children's education there is more to households than just the number of siblings. A quantity-quality trade-off was found in a number of cases, with 8 significant negative results and a further 6 where the coefficient is negative although not significantly different from 0. However, in the other 7 samples the coefficient was either positive and insignificant or indistinguishable from zero. Therefore, though the number of siblings has a significant negative effect in some cases, the finding is not as robust as theory suggests. The assumptions necessary for a QQT are very basic, requiring only that income is limited and parents value both a large number of children (which makes sense from a biological perspective) and quality children (which parental altruism would suggest). Our findings reflect the ambivalent status of the QQT in the empirical literature discussed earlier.

One explanation for this lack of robust results is that while having less children should free up resources to invest in the remaining children, there may be contexts where children can relax the budget constraint. The contributions to the household budget of farm labour and child labour in general seem especially pertinent here. In a similar vein, we possibly fail to uncover a QQT in certain societies because the household structure, e.g. the presence of extended family members, affects the budget constraints and who takes the choice to have and educate children.[14]

While our results may partially be driven by data issues, they could be of importance for theories, such as Unified Growth Theory, which incorporate the QQT explicitly into their underpinnings. The observation that the QQT appears to be stronger at later stages of development is especially important. The increasing opportunity costs of childrearing may be part of the explanation. Another interesting avenue to explore is the potential contribution of children to the household budget. As the returns to education increase, the opportunity costs of child labour increase. This could account for a lack of QQT at first, as additional children also provide resources.

[14] In other work, Carmichael et. al. (2015) summarise the concept of the QQT from an evolutionary biology perspective which highlights that parents of all species and across the world face choices as to whether to invest their limited resources in a large number of offspring with little investment in quality or vice versa. In evolutionary biology the measure of quality is differently construed, mainly used to denote investments which improve life expectancy, height, weight (i.e. which improve chances of reproductive success).

Contexts of high child mortality or where high fertility is linked to higher social or religious status (see e.g. Caldwell and Caldwell 1990), could mean that the tradeoff between quantity and quality is inhibited. Similarly the effects of schooling on fertility may be mitigated by other family strategies, such as requiring older children who are no longer compelled to attend school to work, while sending younger children to school for a longer period (Emerson and Souza 2002; Lingwall 2014, Ch. 4; Lingwall 2014, Ch. 3).[15]

However, although a consistently strong QQT is not found, other household-level determinants of children's educational outcomes are shown to matter. Household extensions can have a positive effect on average educational attainment per child. Upward extensions especially, were found to have beneficial effect on educational attainment. At present, we have not divided this effect by grandmothers and grandfathers, but the result suggests that further historical research should delve deeper into the 'grandmother hypothesis'. It is noticeable that in a nuclear family setting, such as the US, the addition of grandparents is not a drain, but seems to stimulate children's schooling. This aligns with the findings of Bras, et. al. (2010) who find that for the Netherlands, from 1840 to 1925, the presence of kin extensions has a buffering effect on the wellbeing of children. However in Jasenica and Kruja, which have the highest level of upward extensions in our dataset, the effect was negligible or negative. This suggests that in the context of frequent upward extensions the way in which the presence of grandparent's works is different from those contexts where they are far less frequent. Lateral extensions did not have a consistent, significant effect.

When it comes to gendered outcomes we found that boys were, on average, more likely to be enrolled than girls. However, the reverse was true in the USA in 1910 and 1900 and Ireland in 1901. The first explorations of the female household position yielded positive yet limited results. We found that the mother's educational status, as measured by literacy, mattered. This corroborates contemporary research that claims that mothers' education is important for the education of the next generation (Handa 1994; Glick and Sahn 2000). We found a limited relationship between the Patriarchy Index and the coefficients on the QQT, this links to our finding of no effect of the sibling composition of the household.

The finding that maternal literacy did in fact contribute to the QQT, may mean that women's knowledge is especially important in determining investments in children, for instance because it is important for children's

[15] Such negative spillovers could explain why we fail to find an effect, because our data captures children who are in schooling, but no longer compelled to attend.

health and personal reproduction (Jejeebhoy 1995; Janssens 2007: 9). Ideally we would also explore maternal labour force participation however data on women's occupation is often missing.[16] Surprisingly, the spousal age gap proved a weak predictor of a child's education, an unexpected finding in light of the findings on the basis of aggregate data (van der Vleuten 2015b). This could be because at an individual level spousal age gaps not only reflect bargaining power between the spouses, but may also reflect developments on the marriage market. It could also be driven by the fact that certain age gaps between spouses may be culturally preferred and thus deviation from such an age gap has different meanings in different contexts.

Building and using datasets to test these sorts of hypotheses has a number of requirements. The first has to do with size. As the QQT seems to be a relatively small effect, large datasets are required in order to be able to discern a result significantly different from zero (1000 children or more). Secondly the coding of occupational statuses is key. Standard classification system like HISCO or OCCHISCO do not code for students as an occupational status, which is understandable given the scope of the system. However, it meant we had to manually code students from occupational strings which may make reproducibility of our results in other settings difficult. A related point is that in an ideal world the occupational status of parents would be coded in a way that allows for a conversion to social status or income indicators in a comparable way (e.g. Lambert et al. 2013). A further useful step would be to try and derive a way to estimate completed family size from census data when it is not directly mentioned. In longitudinal studies this is possible, obviously, but in census snapshots the information is often missing. Possibly using average fertility, singulate mean age at leaving home and singulate mean age at marriage one could work out the number of missing children. Finally, data linkage, between various sources of microdata as well as with macro data would facilitate comparisons and allow more thorough exploration of the link between the household behaviour and the environment.

[16] This is a common issue with census data (Humphries and Sarasúa 2012; Schmidt and van Nederveen Meerkerk 2012).

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Appendices

Table A1. Legend to appendix regression tables

Indicator	Meaning
nsib	Number of siblings
age	Age
maleTRUE	Child is male
nserv	Number of servants present the household
urbanTRUE	
motheragefirstchild	Implied age of the mother at first child
spousagegap	Age gap between husband and wife (spousal age gap)
nupw	Number of upward relatives living in the household (grandparents)
nlat	Number of lateral relatives living in the household (uncles and aunts)
nextd	Number of both upward and lateral relatives living in the household (when we cannot differentiate between the two)
factor(birthorder)N	Child's birth rank, N being the rank.
factor(fatherliterate)TRUE	Father is literate
factor(motherliterate)TRUE	Mother is literate
nbro	Number of brothers
nsis	Number of sisters
fatherreligionX	Father has religion X (Protestant, Catholic, Orthodox, Jewish, or Other)

Figure A1. Coefficients on number of brothers and number of sisters.
Red indicates sisters and black, brothers. There seems to be no substantial difference between the patterns.

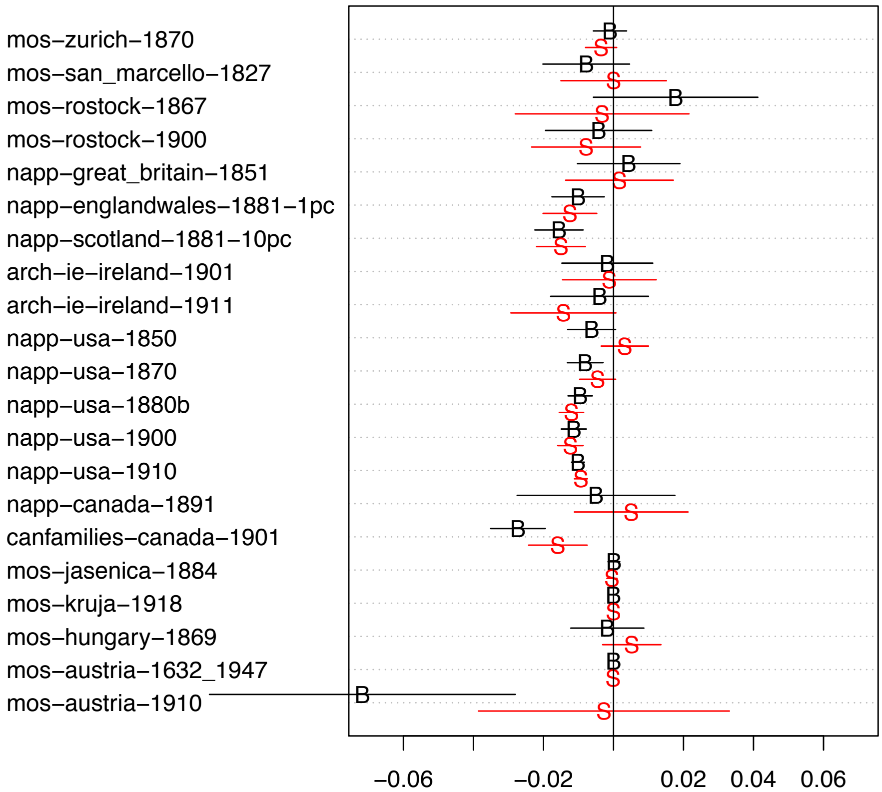

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Table A2. Summary statistics continued

Country	HH size	Singles over 16	N children	Enrollment	Age heaping	Literacy 7+	Female hh heads
Hungary 1869	4.75	0.24	2.63	0.09	93.86	0.39	0.13
Rostock 1867	4.16	0.46	2.33	0.44	101.37	NA	0.24
San Marcello 1827	5.44	0.46	3.09	0.11	91.91	NA	0
Kruja 1918	5.62	0.19	2.58	0.03	292.79	0.04	0.03
Rostock 1900	3.74	0.33	2.16	0.26	102.25	NA	0.23
Jasenica 1884	6.4	0.2	3.36	0.02	211.85	0.12	0.02
Zurich 1870	4.62	0.53	2.19	0.09	103.07	NA	0.01
Austria 1632-1947	5.62	0.5	2.71	0.05	119.27	NA	0
Austria 1910	4.7	0.47	3.03	0.72	99.66	0.97	0.16
Ireland 1911	4.63	0.48	3.2	0.85	147.97	0.89	0.23
Ireland 1901	4.78	0.49	3.31	0.82	196.34	0.87	0.24
Scotland 1881	5.99	0.44	3.7	0.79	120.36	NA	0.17
England and Wales 1881	6	0.39	3.61	0.73	113.64	NA	0.13
Great Britain 1851	6	0.42	3.44	0.5	124.43	NA	0.14
Great Britain 1851	6	0.42	3.44	0.5	124.43	NA	0.14
USA 1860	5.03	1	3.24	0.68	150.11	0.57	0.09
USA 1850	5.29	1	3.46	0.63	148.65	0.54	0.09
USA 1870	4.83	1	3.1	0.57	156.47	0.75	0.11
USA 1880	6.08	0.37	3.71	0.55	152.1	0.73	0.1
USA 1900	5.73	0.38	3.58	0.65	119.08	0.81	0.1
USA 1910	4.21	0.32	2.81	0.87	119.65	0.86	0.12
Canada 1901	4.99	0.39	3.37	0.91	115.35	0.94	0.09

Table A3.

Country	Young brides	Older wives	Female non kin	Old men	Neolocal	Old join	Old lateral	Married Daughter	Last child boy
Hungary 1869	0.17	0.11	0.21	0.18	0.31	0.06	0.01	0.07	0.51
Rostock 1867	0.02	0.21	0.36	0.1	0.17	0	0.06	0.01	0.49
San Marcello 1827	0.07	0.1	0.32	0.23	0.1	0	0.38	0.06	0.44
Kruja 1918	0.31	0.03	0.21	0.14	0.3	0.21	0.23	0.01	0.52
Rostock 1900	0.02	0.19	0.21	0.17	0.38	0	0.06	0.02	0.48
Jasenica 1884	0.16	0.1	0.26	0.07	0.31	0.3	0.12	0.02	0.45
Zurich 1870	0.01	0.21	0	0.19	0.17	0	0	0.01	0.46
Austria 1632-1947	0.01	0.26	0	0.47	0.16	0	0	0.01	0.5
Austria 1910	0.01	0.23	0.26	0.33	0.18	0	0.13	0.02	0.51
Ireland 1911	0.01	0.18	0.16	0.16	0.12	0	0.13	0.04	0.52
Ireland 1901	0.01	0.13	0.16	0.14	0.12	0	0.13	0.05	0.51
Scotland 1881	0.01	0.2	0.25	0.22	0.22	0	0.12	0.07	0.5
England and Wales 1881	0.02	0.23	0.28	0.31	0.27	0	0.11	0.07	0.5
Great Britain 1851	0.01	0.24	0.32	0.27	0.22	0	0.1	0.06	0.51
Great Britain 1851	0.01	0.24	0.32	0.27	0.22	0	0.1	0.06	0.51
USA 1860	0	0.13	0.12	0.25	0.39	0	0.04	0	0.5
USA 1850	0	0.13	0.14	0.23	0.37	0	0.03	0	0.51
USA 1870	0	0.13	0.13	0.24	0.4	0	0.04	0	0.5
USA 1880	0.08	0.12	0.15	0.28	0.27	0	0.09	0.08	0.51
USA 1900	0.07	0.12	0.14	0.31	0.24	0.01	0.09	0.08	0.5
USA 1910	0.12	0.13	0.11	0.26	0.36	0	0.07	0.06	0.5
Canada 1901	0.05	0.15	0.12	0.25	0.27	0	0.07	0.03	0.5

	OLS	OLS	IV	OLS-lit	Logit-enrol	Mfx
(Intercept)	4.806^{***}	4.674^{***}	4.607^{***}	0.821^{***}	15.298^{***}	2.094^{***}
	(0.501)	(0.504)	(0.613)	(0.188)	(4.272)	(0.701)
nsib	-0.018^{*}		0.013	−0.003	-0.162^{**}	-0.022^{**}
	(0.010)		(0.062)	(0.003)	(0.071)	(0.010)
age	-0.295^{***}	-0.290^{***}	-0.300^{***}	0.011^{*}	-2.130^{***}	-0.292^{***}
	(0.024)	(0.024)	(0.026)	(0.006)	(0.260)	(0.054)
maleTRUE	0.229^{***}	0.227^{***}	0.236^{***}	0.008	1.813^{***}	0.245^{***}
	(0.044)	(0.043)	(0.046)	(0.010)	(0.350)	(0.040)
nserv	0.026	0.021	0.029	0.014	0.198	0.027
	(0.027)	(0.027)	(0.028)	(0.008)	(0.169)	(0.023)
urbanTRUE	0.055	0.057	0.070	0.006	0.429	0.059
	(0.115)	(0.115)	(0.118)	(0.019)	(0.835)	(0.115)
nupw	0.093	0.094	0.090	0.007	0.491	0.067
	(0.076)	(0.077)	(0.080)	(0.010)	(0.629)	(0.088)
nlat	0.046	0.056^{*}	0.024	0.031^{*}	0.306	0.042
	(0.032)	(0.033)	(0.057)	(0.019)	(0.252)	(0.035)
factor(birthorder)2	−0.047	−0.041	−0.062	−0.011	−0.557	−0.075
	(0.056)	(0.055)	(0.064)	(0.018)	(0.383)	(0.052)
factor(birthorder)3	0.116^{*}	0.126^{**}	0.073	0.016	0.801^{*}	0.108^{*}
	(0.062)	(0.062)	(0.103)	(0.010)	(0.448)	(0.059)
factor(birthorder)4	0.048	0.048	−0.025	0.022	0.297	0.040
	(0.078)	(0.078)	(0.167)	(0.014)	(0.555)	(0.075)
factor(birthorder)5	0.172	0.194^{*}	0.081	0.015	1.222^{*}	0.163^{*}
	(0.115)	(0.117)	(0.215)	(0.013)	(0.740)	(0.091)
factor(birthorder)6	-0.214^{**}	-0.161^{*}	−0.354	0.019	-1.765^{**}	-0.225^{***}
	(0.097)	(0.098)	(0.282)	(0.018)	(0.782)	(0.084)
factor(birthorder)7	0.175	0.198	−0.018	0.031^{*}	0.939	0.126
	(0.257)	(0.239)	(0.448)	(0.016)	(1.911)	(0.246)
motheragefirstchild	-0.013^{**}	-0.012^{**}	−0.008	−0.002	-0.111^{***}	-0.015^{***}
	(0.006)	(0.006)	(0.011)	(0.002)	(0.041)	(0.006)
spousagegap	−0.000	−0.000	0.000	−0.001	−0.012	−0.002
	(0.003)	(0.003)	(0.004)	(0.001)	(0.019)	(0.003)
fatherliterateTRUE	0.031	0.004	0.046	0.012	0.087	0.012
	(0.136)	(0.134)	(0.141)	(0.048)	(1.000)	(0.137)
motherliterateTRUE	−0.029	0.001	−0.072	0.110	1.228	0.162
	(0.160)	(0.166)	(0.183)	(0.117)	(0.964)	(0.116)
nbro		-0.037^{***}				
		(0.013)				
nsis		0.001				
		(0.013)				
R^2	0.408	0.414	0.396	0.122		
Adj. R^2	0.321	0.326	0.307	-0.007		
Num. obs.	454	454	454	454	454	454
RMSE	0.412	0.410	0.416	0.105		
AIC					498.057	498.057
BIC					741.025	741.025
Log Likelihood					-190.029	-190.029
Deviance					380.057	380.057

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 1: mos austria 1910, enrolment

	OLS	OLS	IV	Logit	Mfx
(Intercept)	-0.172^{**}	-0.173^{**}	-0.096	-32.175^{***}	-0.516^{***}
	(0.080)	(0.081)	(0.083)	(2.361)	(0.067)
nsib	0.002		-0.008	-0.036	-0.001
	(0.004)		(0.006)	(0.071)	(0.001)
age	0.001	0.001	0.003^{*}	0.830^{***}	0.013^{***}
	(0.001)	(0.001)	(0.001)	(0.117)	(0.002)
maleTRUE	0.026^{***}	0.026^{***}	0.025^{***}	3.257^{***}	0.036^{***}
	(0.008)	(0.008)	(0.008)	(0.479)	(0.004)
nserv	-0.001	-0.002	-0.001	-0.094	-0.002
	(0.002)	(0.002)	(0.002)	(0.071)	(0.001)
urbanTRUE	0.174^{***}	0.175^{***}	0.166^{***}	1.233^{***}	0.016^{***}
	(0.044)	(0.044)	(0.043)	(0.462)	(0.005)
nextd	0.001	0.002	0.003	0.370	0.006
	(0.007)	(0.007)	(0.007)	(0.298)	(0.005)
factor(birthorder)1	0.042^{*}	0.041^{*}	-0.005	-0.540	-0.009
	(0.024)	(0.024)	(0.034)	(0.959)	(0.015)
factor(birthorder)2	0.051^{**}	0.050^{**}	0.012	-0.706	-0.010
	(0.021)	(0.021)	(0.030)	(0.946)	(0.013)
factor(birthorder)3	0.020	0.019	-0.012	-0.472	-0.007
	(0.019)	(0.019)	(0.026)	(0.937)	(0.012)
factor(birthorder)4	0.028	0.027	0.005	-0.696	-0.009
	(0.022)	(0.022)	(0.024)	(0.998)	(0.011)
factor(birthorder)5	0.026^{*}	0.024^{*}	0.010	1.514^{*}	0.037
	(0.013)	(0.014)	(0.015)	(0.782)	(0.026)
motheragefirstchild	-0.002^{*}	-0.002^{*}	-0.002^{**}	-0.025	-0.000
	(0.001)	(0.001)	(0.001)	(0.029)	(0.000)
spousagegap	-0.000	-0.000	-0.000	-0.027^{*}	-0.000^{*}
	(0.000)	(0.000)	(0.000)	(0.016)	(0.000)
factor(century)18	-0.011^{*}	-0.010^{*}	-0.007	15.987^{***}	0.340^{***}
	(0.006)	(0.006)	(0.007)	(0.174)	(0.027)
factor(century)19	-0.017	-0.015	-0.013	16.633^{***}	0.699^{***}
	(0.024)	(0.024)	(0.024)	(0.879)	(0.025)
nbro		0.000			
		(0.005)			
nsis		0.005			
		(0.004)			
factor(century)17				14.297^{***}	0.397^{***}
				(0.717)	(0.002)
R^2	0.217	0.218	0.209		
Adj. R^2	0.188	0.188	0.179		
Num. obs.	948	948	948	4860	4860
RMSE	0.133	0.133	0.133		
AIC				639.627	639.627
BIC				879.713	879.713
Log Likelihood				-282.814	-282.814
Deviance				565.627	565.627

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. controls included.

Table 2: Austria 1632-1947, enrolment

	OLS	OLS	IV	OLS-lit	Logit-enrol	Mfx
(Intercept)	2.390^{***}	2.393^{***}	2.589^{***}	0.642^{***}	16.457^{***}	1.976^{***}
	(0.207)	(0.206)	(0.315)	(0.070)	(1.683)	(0.221)
nsib	-0.009^{***}		-0.029	0.001	-0.070^{***}	-0.008^{***}
	(0.003)		(0.024)	(0.001)	(0.026)	(0.003)
age	-0.104^{***}	-0.104^{***}	-0.102^{***}	0.001	-0.846^{***}	-0.105^{***}
	(0.012)	(0.012)	(0.012)	(0.004)	(0.095)	(0.012)
maleTRUE	0.004	0.004	0.005	-0.010^{**}	0.019	0.002
	(0.012)	(0.012)	(0.012)	(0.004)	(0.098)	(0.012)
nserv	0.006	0.005	0.007	-0.001	0.098	0.012
	(0.014)	(0.014)	(0.014)	(0.003)	(0.211)	(0.025)
urbanTRUE	0.012	0.011	0.004	0.018^{***}	0.085	0.010
	(0.017)	(0.017)	(0.018)	(0.005)	(0.158)	(0.019)
nlat	0.031^{*}	0.030^{*}	0.029^{*}	0.009	0.305	0.037
	(0.017)	(0.018)	(0.017)	(0.006)	(0.186)	(0.022)
nupw	0.004	0.004	0.002	0.003	0.091	0.011
	(0.021)	(0.021)	(0.022)	(0.007)	(0.197)	(0.024)
factor(birthorder)1	-0.045	-0.049	-0.146	-0.024^{*}	-0.275	-0.034
	(0.089)	(0.087)	(0.152)	(0.014)	(0.663)	(0.083)
factor(birthorder)2	-0.077	-0.080	-0.160	-0.022	-0.539	-0.068
	(0.088)	(0.087)	(0.136)	(0.013)	(0.658)	(0.088)
factor(birthorder)3	-0.087	-0.091	-0.157	-0.019	-0.616	-0.081
	(0.088)	(0.087)	(0.125)	(0.013)	(0.656)	(0.094)
factor(birthorder)4	-0.035	-0.039	-0.087	-0.020	-0.225	-0.028
	(0.088)	(0.087)	(0.112)	(0.014)	(0.658)	(0.086)
factor(birthorder)5	0.004	0.000	-0.031	-0.019	0.125	0.015
	(0.089)	(0.088)	(0.102)	(0.015)	(0.680)	(0.077)
factor(birthorder)6	0.031	0.027	0.017	-0.022	0.302	0.034
	(0.095)	(0.094)	(0.101)	(0.018)	(0.745)	(0.077)
motheragefirstchild	0.000	0.000	-0.002	0.001	0.004	0.001
	(0.002)	(0.002)	(0.003)	(0.001)	(0.015)	(0.002)
spousagegap	0.001	0.001	0.001	-0.000	0.010	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.010)	(0.001)
fatherliterateTRUE	0.106^{***}	0.107^{***}	0.103^{***}	0.096^{***}	0.510^{***}	0.069^{***}
	(0.033)	(0.033)	(0.033)	(0.016)	(0.162)	(0.024)
motherliterateTRUE	0.173^{***}	0.173^{***}	0.177^{***}	0.226^{***}	0.806^{***}	0.116^{***}
	(0.040)	(0.040)	(0.040)	(0.023)	(0.186)	(0.031)
fatherreligionother	-0.051	-0.048	-0.067	0.011	-0.365	-0.048
	(0.075)	(0.077)	(0.081)	(0.035)	(0.828)	(0.117)
fatherreligionprotestant	0.005	0.009	-0.012	0.009	0.081	0.010
	(0.049)	(0.049)	(0.056)	(0.021)	(0.428)	(0.052)
motherreligionother	0.030	0.028	0.033	-0.071	0.228	0.026
	(0.080)	(0.081)	(0.082)	(0.043)	(0.836)	(0.089)
motherreligionprotestant	0.013	0.009	0.014	0.007	0.105	0.013
	(0.047)	(0.046)	(0.048)	(0.019)	(0.410)	(0.050)
factor(fatherethnic)french	-0.012	-0.011	0.003	-0.024	-0.131	-0.016
	(0.062)	(0.062)	(0.064)	(0.022)	(0.429)	(0.054)
factor(fatherethnic)german	-0.079	-0.078	-0.085	-0.001	-0.608	-0.084
	(0.056)	(0.057)	(0.054)	(0.010)	(0.460)	(0.071)
factor(fatherethnic)other	-0.055	-0.054	-0.050	-0.012	-0.514	-0.069
	(0.043)	(0.044)	(0.044)	(0.010)	(0.357)	(0.053)
factor(motherethnic)french	-0.105^{*}	-0.106^{*}	-0.110^{*}	0.006	-0.667	-0.088
	(0.063)	(0.063)	(0.062)	(0.023)	(0.436)	(0.063)
factor(motherethnic)german	-0.013	-0.015	-0.004	-0.011	-0.197	-0.025
	(0.056)	(0.057)	(0.055)	(0.011)	(0.472)	(0.062)
factor(motherethnic)other	0.015	0.015	0.013	-0.020^{*}	0.103	0.012
	(0.043)	(0.043)	(0.043)	(0.011)	(0.368)	(0.042)
nbro		-0.015^{***}				
		(0.005)				
nsis		-0.003				
		(0.005)				
R^2	0.146	0.147	0.137	0.219		
Adj. R^2	0.137	0.138	0.127	0.213		
Num. obs.	3676	3676	3676	5772	3676	3676
RMSE	0.351	0.351	0.353	0.163		
AIC					2936.035	2936.035
BIC					3190.628	3190.628
Log Likelihood					-1427.018	-1427.018
Deviance					2854.035	2854.035

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 3: canfamilies canada 1901, enrolment

	OLS	OLS	IV	OLS-lit	Logit-enrol	Mfx
(Intercept)	0.128	0.087	0.138	0.154	-3.291	-0.342
	(0.618)	(0.622)	(0.616)	(0.627)	(5.781)	(0.605)
nsib	-0.012			-0.038^{**}	-0.100	-0.010
	(0.009)			(0.019)	(0.099)	(0.011)
age	0.004	-0.000	0.003	0.017	0.032	0.003
	(0.042)	(0.042)	(0.042)	(0.041)	(0.411)	(0.042)
maleTRUE	0.010	0.016	0.012	0.008	0.240	0.024
	(0.046)	(0.047)	(0.046)	(0.047)	(0.489)	(0.048)
nserv	0.071	0.076	0.070	0.059	0.315	0.033
	(0.058)	(0.058)	(0.057)	(0.062)	(0.294)	(0.031)
nlat	0.059	0.060	0.053	0.053	0.666	0.080
	(0.162)	(0.163)	(0.161)	(0.162)	(1.480)	(0.199)
nupw	-0.047	-0.059	-0.057	-0.050	-0.834	-0.087
	(0.075)	(0.073)	(0.077)	(0.079)	(1.606)	(0.168)
motheragefirstchild	0.004	0.004	0.004	0.000	0.050	0.005
	(0.006)	(0.006)	(0.006)	(0.006)	(0.054)	(0.006)
spousagegap	0.008^{**}	0.008^{**}	0.008^{**}	0.007	0.062^{*}	0.006^{*}
	(0.004)	(0.004)	(0.004)	(0.004)	(0.032)	(0.004)
fatherliterateTRUE	0.096^{*}	0.056	0.095^{*}	0.089	1.249	0.105^{*}
	(0.056)	(0.055)	(0.056)	(0.057)	(0.839)	(0.058)
motherliterateTRUE	0.005	-0.030	0.004	0.019	0.084	0.009
	(0.068)	(0.071)	(0.069)	(0.070)	(0.905)	(0.091)
fatherreligionprotestant	-0.420^{***}	-0.420^{***}	-0.426^{***}	-0.438^{***}	-3.076^{**}	-0.352^{***}
	(0.128)	(0.131)	(0.130)	(0.130)	(1.291)	(0.136)
motherreligionprotestant	0.334^{***}	0.346^{***}	0.340^{***}	0.323^{**}	2.376^{*}	0.234^{*}
	(0.129)	(0.131)	(0.131)	(0.128)	(1.320)	(0.119)
literateTRUE		0.118^{**}				
		(0.058)				
nbro			-0.017			
			(0.013)			
nsis			-0.005			
			(0.012)			
R^2	0.199	0.201	0.200	0.176		
Adj. R^2	0.138	0.140	0.136	0.113		
Num. obs.	297	297	297	297	297	297
RMSE	0.339	0.339	0.340	0.344		
AIC					246.214	246.214
BIC					327.476	327.476
Log Likelihood					-101.107	-101.107
Deviance					202.214	202.214

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. controls included.

Table 4: napp canada 1891, enrolment

	OLS	OLS	IV	Logit	Mfx
(Intercept)	3.402^{***}	3.402^{***}	3.407^{***}	14.181^{***}	2.779^{***}
	(0.132)	(0.132)	(0.159)	(0.694)	(0.148)
nsib	-0.010^{***}		-0.011	-0.052^{***}	-0.010^{***}
	(0.002)		(0.018)	(0.013)	(0.003)
age	-0.207^{***}	-0.207^{***}	-0.207^{***}	-1.017^{***}	-0.199^{***}
	(0.005)	(0.005)	(0.006)	(0.028)	(0.007)
maleTRUE	-0.085^{***}	-0.085^{***}	-0.085^{***}	-0.423^{***}	-0.084^{***}
	(0.008)	(0.008)	(0.008)	(0.042)	(0.008)
nserv	0.069^{***}	0.069^{***}	0.069^{***}	0.442^{***}	0.087^{***}
	(0.008)	(0.008)	(0.008)	(0.062)	(0.013)
urbanTRUE	0.069^{***}	0.069^{***}	0.069^{***}	0.358^{***}	0.071^{***}
	(0.012)	(0.012)	(0.013)	(0.061)	(0.012)
nlat	0.013	0.013	0.012	0.062	0.012
	(0.015)	(0.015)	(0.015)	(0.074)	(0.015)
nupw	0.028	0.028	0.028	0.143	0.028
	(0.021)	(0.021)	(0.021)	(0.101)	(0.020)
factor(birthorder)2	-0.024^{**}	-0.023^{**}	-0.023	-0.120^{**}	-0.024^{**}
	(0.010)	(0.010)	(0.016)	(0.049)	(0.010)
factor(birthorder)3	0.001	0.001	0.002	0.005	0.001
	(0.012)	(0.012)	(0.028)	(0.062)	(0.012)
factor(birthorder)4	0.026	0.026	0.029	0.135	0.027
	(0.017)	(0.017)	(0.042)	(0.083)	(0.017)
factor(birthorder)5	0.040	0.040	0.043	0.185	0.037
	(0.029)	(0.029)	(0.060)	(0.139)	(0.028)
factor(birthorder)6	0.048	0.048	0.053	0.274	0.054
	(0.058)	(0.058)	(0.093)	(0.270)	(0.054)
factor(birthorder)7	0.347^{***}	0.347^{***}	0.353^{**}	1.781^{**}	0.341^{***}
	(0.123)	(0.123)	(0.152)	(0.738)	(0.119)
factor(birthorder)8	0.194	0.194	0.201	0.829	0.167
	(0.283)	(0.283)	(0.301)	(1.280)	(0.255)
motheragefirstchild	0.003^{**}	0.003^{**}	0.003	0.014^{**}	0.003^{**}
	(0.001)	(0.001)	(0.003)	(0.006)	(0.001)
spousagegap	0.002^{**}	0.002^{**}	0.002^{**}	0.010^{**}	0.002^{**}
	(0.001)	(0.001)	(0.001)	(0.005)	(0.001)
nbro		-0.010^{***}			
		(0.003)			
nsis		-0.010^{***}			
		(0.003)			
R^2	0.180	0.180	0.180		
Adj. R^2	0.175	0.175	0.175		
Num. obs.	11887	11887	11887	11887	11887
RMSE	0.445	0.445	0.445		
AIC				13810.201	13810.201
BIC				14349.174	14349.174
Log Likelihood				-6832.100	-6832.100
Deviance				13664.201	13664.201

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 5: napp englandwales 1881 1pc, enrolment

	OLS	OLS	IV	Logit	Mfx
(Intercept)	1.465^{***}	1.465^{***}	1.840^{***}	4.789^{***}	1.006^{***}
	(0.128)	(0.128)	(0.526)	(0.970)	(0.205)
nsib	0.002		−0.035	0.008	0.002
	(0.006)		(0.050)	(0.027)	(0.006)
age	-0.049^{***}	-0.049^{***}	-0.041^{***}	-0.225^{***}	-0.047^{***}
	(0.003)	(0.003)	(0.011)	(0.013)	(0.003)
maleTRUE	0.016	0.016	0.016	0.075	0.016
	(0.011)	(0.011)	(0.011)	(0.054)	(0.011)
nserv	0.032^{***}	0.032^{***}	0.036^{***}	0.190^{***}	0.040^{***}
	(0.007)	(0.007)	(0.009)	(0.050)	(0.011)
urbanTRUE	0.033	0.033	0.022	0.153	0.032
	(0.021)	(0.021)	(0.026)	(0.096)	(0.020)
nlat	−0.013	−0.013	−0.012	−0.070	−0.015
	(0.024)	(0.024)	(0.024)	(0.114)	(0.024)
nupw	−0.028	−0.028	−0.024	−0.131	−0.027
	(0.040)	(0.040)	(0.041)	(0.190)	(0.040)
factor(birthorder)1	-0.200^{**}	-0.200^{**}	−0.476	−1.235	−0.246
	(0.094)	(0.094)	(0.383)	(0.868)	(0.150)
factor(birthorder)2	-0.213^{**}	-0.213^{**}	−0.460	−1.294	-0.256^{*}
	(0.092)	(0.092)	(0.345)	(0.864)	(0.146)
factor(birthorder)3	-0.219^{**}	-0.219^{**}	−0.437	−1.328	-0.260^{*}
	(0.090)	(0.090)	(0.304)	(0.859)	(0.142)
factor(birthorder)4	-0.232^{***}	-0.232^{***}	−0.417	−1.390	-0.270^{*}
	(0.089)	(0.089)	(0.262)	(0.856)	(0.138)
factor(birthorder)5	-0.233^{***}	-0.233^{***}	-0.388^{*}	−1.404	-0.273^{**}
	(0.088)	(0.088)	(0.223)	(0.855)	(0.138)
factor(birthorder)6	-0.173^{**}	-0.173^{**}	−0.293	−1.096	−0.221
	(0.088)	(0.088)	(0.180)	(0.857)	(0.155)
factor(birthorder)7	-0.217^{**}	-0.217^{**}	-0.302^{**}	−1.309	-0.260^{*}
	(0.090)	(0.090)	(0.142)	(0.848)	(0.144)
factor(birthorder)8	−0.101	−0.101	−0.152	−0.621	−0.130
	(0.097)	(0.097)	(0.116)	(0.830)	(0.169)
motheragefirstchild	0.003^{*}	0.003^{*}	0.001	0.016^{*}	0.003^{*}
	(0.002)	(0.002)	(0.004)	(0.009)	(0.002)
spousagegap	-0.004^{**}	-0.004^{**}	-0.005^{**}	-0.020^{***}	-0.004^{***}
	(0.002)	(0.002)	(0.002)	(0.007)	(0.002)
nbro		0.002			
		(0.007)			
nsis		0.002			
		(0.007)			
R^2	0.152	0.152	0.143		
Adj. R^2	0.139	0.139	0.130		
Num. obs.	7122	7122	7122	7122	7122
RMSE	0.463	0.463	0.465		
AIC				8827.185	8827.185
BIC				9528.021	9528.021
Log Likelihood				-4311.593	-4311.593
Deviance				8623.185	8623.185

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 6: napp great britain 1851, enrolment

	OLS	OLS	IV	OLS-lit	Logit-enrol	Mfx
(Intercept)	1.119^{***}	1.121^{***}	1.140^{***}	0.483^{***}	-0.907	-0.044
	(0.108)	(0.109)	(0.178)	(0.178)	(2.197)	(0.106)
nsib	-0.006		-0.010	-0.000	-0.032	-0.002
	(0.004)		(0.023)	(0.009)	(0.086)	(0.004)
age	-0.010^{*}	-0.010^{*}	-0.009	-0.012	-0.333^{***}	-0.016^{**}
	(0.006)	(0.006)	(0.007)	(0.010)	(0.127)	(0.007)
maleTRUE	0.077^{***}	0.077^{***}	0.077^{***}	0.048^{**}	2.156^{***}	0.094^{***}
	(0.013)	(0.013)	(0.013)	(0.023)	(0.361)	(0.013)
nserv	0.017	0.017	0.017	0.017	-0.022	-0.001
	(0.020)	(0.020)	(0.020)	(0.023)	(0.234)	(0.011)
nlat	0.012	0.012	0.012	-0.043^{***}	-0.125	-0.006
	(0.007)	(0.007)	(0.008)	(0.016)	(0.393)	(0.019)
factor(birthorder)1	-0.006	-0.009	-0.016	0.187^{**}	-0.559	-0.027
	(0.053)	(0.054)	(0.089)	(0.076)	(0.755)	(0.036)
factor(birthorder)2	0.008	0.005	0.000	0.145^{**}	-0.561	-0.026
	(0.053)	(0.054)	(0.077)	(0.073)	(0.749)	(0.032)
factor(birthorder)3	0.024	0.021	0.019	0.174^{**}	-0.196	-0.009
	(0.054)	(0.055)	(0.064)	(0.072)	(0.752)	(0.034)
factor(birthorder)4	-0.036	-0.037	-0.039	0.091	-2.344^{**}	-0.062^{***}
	(0.056)	(0.056)	(0.059)	(0.068)	(0.976)	(0.012)
motheragefirstchild	-0.002	-0.002	-0.002	-0.004	-0.062^{*}	-0.003^{*}
	(0.001)	(0.001)	(0.002)	(0.003)	(0.034)	(0.002)
spousagegap	0.000	0.000	0.000	0.001	0.009	0.000
	(0.001)	(0.001)	(0.001)	(0.002)	(0.027)	(0.001)
fatherliterateTRUE	0.019	0.019	0.019	0.169^{***}	0.836^{**}	0.041^{**}
	(0.018)	(0.018)	(0.018)	(0.038)	(0.347)	(0.017)
motherliterateTRUE	0.043^{**}	0.043^{**}	0.043^{**}	0.227^{***}	0.668^{*}	0.033^{*}
	(0.019)	(0.019)	(0.019)	(0.040)	(0.342)	(0.018)
fatherreligionjewish	0.080	0.080	0.083	0.114	1.643^{***}	0.120^{**}
	(0.062)	(0.062)	(0.061)	(0.083)	(0.510)	(0.052)
fatherreligionorthodox	-0.005	-0.005	-0.005	0.009	0.334	0.017
	(0.025)	(0.025)	(0.025)	(0.042)	(0.551)	(0.031)
fatherreligionprotestant	0.010	0.010	0.010	0.059^{*}	-0.219	-0.010
	(0.017)	(0.017)	(0.017)	(0.035)	(0.349)	(0.016)
nbro		-0.008				
		(0.006)				
nsis		-0.005				
		(0.005)				
R^2	0.326	0.326	0.326	0.525		
Adj. R^2	0.256	0.255	0.255	0.475		
Num. obs.	1277	1277	1277	1257	1277	1277
RMSE	0.215	0.215	0.215	0.362		
AIC					491.301	491.301
BIC					614.955	614.955
Log Likelihood					-221.650	-221.650
Deviance					443.301	443.301

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included, except in logit model.

Table 7: mos hungary 1869, enrolment

	OLS	OLS	IV	OLS-lit	Logit-enrol	Mfx
(Intercept)	3.141^{***}	3.143^{***}	3.060^{***}	0.881^{***}	12.322^{***}	2.536^{***}
	(0.266)	(0.266)	(0.305)	(0.090)	(1.247)	(0.277)
nsib	-0.005		0.022	-0.000	-0.028	-0.006
	(0.005)		(0.043)	(0.001)	(0.023)	(0.005)
age	-0.203^{***}	-0.203^{***}	-0.211^{***}	-0.004	-0.947^{***}	-0.202^{***}
	(0.017)	(0.017)	(0.018)	(0.006)	(0.081)	(0.017)
maleTRUE	-0.048^{***}	-0.048^{***}	-0.048^{***}	-0.015^{***}	-0.240^{***}	-0.049^{***}
	(0.017)	(0.017)	(0.017)	(0.006)	(0.083)	(0.017)
nserv	0.080^{***}	0.080^{***}	0.080^{***}	-0.003	0.547^{***}	0.113^{***}
	(0.019)	(0.019)	(0.020)	(0.004)	(0.166)	(0.035)
urbanTRUE	-0.034	-0.034	-0.023	-0.002	-0.152	-0.032
	(0.021)	(0.021)	(0.025)	(0.007)	(0.102)	(0.021)
nlat	0.009	0.009	0.008	-0.016	0.031	0.006
	(0.026)	(0.026)	(0.026)	(0.012)	(0.131)	(0.027)
nupw	-0.008	-0.008	-0.019	0.010	-0.043	-0.009
	(0.038)	(0.038)	(0.039)	(0.009)	(0.176)	(0.036)
factor(birthorder)2	-0.029	-0.029	-0.044	0.013^{**}	-0.136	-0.028
	(0.022)	(0.022)	(0.032)	(0.006)	(0.104)	(0.022)
factor(birthorder)3	-0.022	-0.022	-0.058	0.000	-0.105	-0.022
	(0.025)	(0.025)	(0.053)	(0.008)	(0.120)	(0.025)
factor(birthorder)4	0.059^{*}	0.059^{*}	0.001	0.001	0.287^{*}	0.058^{*}
	(0.031)	(0.031)	(0.079)	(0.010)	(0.154)	(0.031)
factor(birthorder)5	0.058	0.058	-0.033	0.007	0.278	0.056
	(0.044)	(0.044)	(0.127)	(0.014)	(0.219)	(0.043)
factor(birthorder)6	0.121^{*}	0.121^{*}	0.010	-0.015	0.616^{*}	0.120^{*}
	(0.067)	(0.067)	(0.157)	(0.028)	(0.352)	(0.063)
factor(birthorder)7	0.065	0.065	-0.063	0.015	0.295	0.059
	(0.154)	(0.154)	(0.254)	(0.012)	(0.809)	(0.158)
motheragefirstchild	0.004^{*}	0.004^{*}	0.007	0.001	0.020^{*}	0.004^{*}
	(0.003)	(0.003)	(0.005)	(0.001)	(0.012)	(0.003)
spousagegap	0.002	0.002	0.001	0.001^{***}	0.007	0.001
	(0.001)	(0.001)	(0.001)	(0.000)	(0.007)	(0.001)
fatherliterateTRUE	0.078^{***}	0.078^{***}	0.077^{***}	0.015	0.357^{***}	0.075^{***}
	(0.027)	(0.027)	(0.028)	(0.011)	(0.126)	(0.027)
motherliterateTRUE	0.094^{***}	0.094^{***}	0.093^{**}	0.099^{***}	0.430^{***}	0.091^{***}
	(0.030)	(0.030)	(0.036)	(0.016)	(0.139)	(0.030)
fatherreligionjewish	0.307	0.307	0.245	0.090^{**}	1.687	0.273
	(0.275)	(0.275)	(0.288)	(0.040)	(1.608)	(0.173)
fatherreligionother	-0.296^{**}	-0.296^{**}	-0.282^{**}	0.017	-1.317^{**}	-0.270^{**}
	(0.134)	(0.134)	(0.130)	(0.022)	(0.616)	(0.115)
fatherreligionprotestant	0.027	0.027	0.090	0.022^{**}	0.156	0.032
	(0.116)	(0.117)	(0.124)	(0.011)	(0.545)	(0.110)
motherreligionother	0.090	0.089	0.152	0.003	0.418	0.083
	(0.196)	(0.197)	(0.196)	(0.024)	(1.024)	(0.194)
motherreligionprotestant	0.023	0.023	-0.019	-0.016	0.078	0.016
	(0.118)	(0.118)	(0.125)	(0.011)	(0.550)	(0.112)
nbro		-0.005				
		(0.006)				
nsis		-0.006				
		(0.006)				
R^2	0.146	0.146	0.113	0.094		
Adj. R^2	0.119	0.119	0.097	0.066		
Num. obs.	3014	3014	3014	3014	3014	3014
RMSE	0.462	0.462	0.467	0.148		
AIC					3784.283	3784.283
BIC					4337.297	4337.297
Log Likelihood					-1800.141	-1800.141
Deviance					3600.283	3600.283

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 8: arch ie ireland 1901, enrolment

	OLS	OLS	IV	OLS-lit	Logit-enrol	Mfx
(Intercept)	3.279^{***}	3.268^{***}	3.446^{***}	0.642^{***}	13.595^{***}	2.672^{***}
	(0.315)	(0.315)	(0.302)	(0.128)	(1.538)	(0.325)
nsib	-0.018^{***}		-0.080^{**}	0.003^{**}	-0.090^{***}	-0.018^{***}
	(0.005)		(0.032)	(0.001)	(0.025)	(0.005)
age	-0.217^{***}	-0.217^{***}	-0.202^{***}	0.001	-1.062^{***}	-0.218^{***}
	(0.018)	(0.018)	(0.020)	(0.005)	(0.090)	(0.018)
maleTRUE	0.017	0.018	0.019	−0.007	0.077	0.015
	(0.018)	(0.018)	(0.019)	(0.005)	(0.092)	(0.018)
nserv	0.105^{***}	0.106^{***}	0.114^{***}	−0.007	0.899^{***}	0.177^{***}
	(0.020)	(0.020)	(0.022)	(0.006)	(0.190)	(0.038)
urbanTRUE	-0.049^{**}	-0.048^{**}	-0.078^{***}	0.012^{*}	-0.220^{*}	-0.044^{*}
	(0.024)	(0.024)	(0.027)	(0.006)	(0.118)	(0.024)
nlat	0.042	0.043	0.037	−0.002	0.222	0.044
	(0.029)	(0.029)	(0.032)	(0.007)	(0.155)	(0.030)
nupw	0.026	0.025	0.044	−0.001	0.148	0.029
	(0.041)	(0.040)	(0.045)	(0.010)	(0.210)	(0.041)
factor(birthorder)2	0.025	0.025	0.070^{**}	−0.001	0.131	0.026
	(0.022)	(0.022)	(0.030)	(0.007)	(0.112)	(0.022)
factor(birthorder)3	0.037	0.038	0.113^{**}	−0.007	0.202	0.039
	(0.027)	(0.027)	(0.047)	(0.008)	(0.135)	(0.026)
factor(birthorder)4	0.068^{**}	0.068^{**}	0.194^{**}	0.003	0.365^{**}	0.070^{**}
	(0.033)	(0.033)	(0.076)	(0.007)	(0.172)	(0.032)
factor(birthorder)5	0.117^{**}	0.113^{**}	0.320^{***}	−0.016	0.566^{**}	0.106^{**}
	(0.051)	(0.051)	(0.110)	(0.017)	(0.253)	(0.044)
factor(birthorder)6	0.183^{**}	0.181^{**}	0.404^{***}	−0.024	0.903^{**}	0.161^{***}
	(0.074)	(0.074)	(0.132)	(0.024)	(0.391)	(0.061)
factor(birthorder)7	0.248^{*}	0.241^{*}	0.502^{***}	−0.007	1.230^{*}	0.208^{**}
	(0.137)	(0.133)	(0.178)	(0.011)	(0.726)	(0.097)
factor(birthorder)8	-0.404^{***}	-0.401^{***}	−0.109	−0.002	-14.976^{***}	-0.595^{***}
	(0.051)	(0.051)	(0.141)	(0.013)	(1.049)	(0.009)
factor(birthorder)9	-0.705^{***}	-0.700^{***}	-0.362^{**}	0.014	-16.619^{***}	-0.598^{***}
	(0.070)	(0.071)	(0.178)	(0.028)	(1.106)	(0.009)
motheragefirstchild	0.004	0.004	−0.001	0.002^{**}	0.017	0.003
	(0.003)	(0.003)	(0.004)	(0.001)	(0.014)	(0.003)
spousagegap	−0.001	−0.001	−0.002	0.001	−0.007	−0.001
	(0.002)	(0.002)	(0.002)	(0.000)	(0.008)	(0.002)
fatherliterateTRUE	0.126^{***}	0.126^{***}	0.153^{***}	0.028^{**}	0.594^{***}	0.120^{***}
	(0.033)	(0.033)	(0.033)	(0.012)	(0.156)	(0.032)
motherliterateTRUE	0.051	0.050	0.113^{***}	0.061^{***}	0.238	0.047
	(0.037)	(0.037)	(0.041)	(0.017)	(0.177)	(0.036)
fatherreligionjewish	-0.261^{**}	-0.248^{**}	-0.334^{***}	-0.907^{***}	-14.435^{***}	-0.595^{***}
	(0.111)	(0.112)	(0.102)	(0.053)	(1.150)	(0.009)
fatherreligionother	−0.165	−0.158	−0.217	−0.102	−0.830	−0.167
	(0.217)	(0.216)	(0.215)	(0.129)	(1.212)	(0.242)
fatherreligionprotestant	−0.009	−0.009	−0.017	−0.008	−0.077	−0.015
	(0.082)	(0.082)	(0.088)	(0.045)	(0.387)	(0.077)
motherreligionjewish	0.002	−0.017	0.337	0.978^{***}	13.182^{***}	0.398^{***}
	(0.257)	(0.260)	(0.248)	(0.063)	(1.752)	(0.009)
motherreligionother	0.027	0.028	0.006	-0.318^{**}	0.148	0.029
	(0.150)	(0.151)	(0.158)	(0.130)	(0.742)	(0.142)
motherreligionprotestant	0.005	0.003	0.011	−0.006	0.036	0.007
	(0.083)	(0.083)	(0.088)	(0.043)	(0.389)	(0.076)
nbro		-0.013^{**}				
		(0.006)				
nsis		-0.023^{***}				
		(0.007)				
R^2	0.175	0.175	0.084	0.163		
Adj. R^2	0.144	0.144	0.064	0.131		
Num. obs.	2614	2614	2614	2614	2614	2614
RMSE	0.453	0.453	0.474	0.126		
AIC					3196.624	3196.624
BIC					3760.013	3760.013
Log Likelihood					-1502.312	-1502.312
Deviance					3004.624	3004.624

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 9: arch ie ireland 1911, enrolment

	OLS	OLS	IV	OLS-lit	Logit-enrol	Mfx
(Intercept)	0.014	0.014	-0.012	-0.240^{***}	-4.860^{**}	-0.070^{**}
	(0.029)	(0.029)	(0.047)	(0.075)	(2.293)	(0.035)
nsib	-0.001		0.004	-0.005	-0.044	-0.001
	(0.003)		(0.008)	(0.008)	(0.235)	(0.003)
age	0.001	0.001	0.000	0.026^{***}	0.070	0.001
	(0.001)	(0.001)	(0.002)	(0.003)	(0.078)	(0.001)
maleTRUE	0.032^{***}	0.032^{***}	0.032^{***}	0.216^{***}	3.047^{***}	0.032^{***}
	(0.008)	(0.008)	(0.008)	(0.019)	(0.693)	(0.008)
nserv	0.011	0.011	0.010	0.063^{*}	0.088	0.001
	(0.012)	(0.012)	(0.012)	(0.033)	(0.633)	(0.009)
nlat	-0.001	-0.001	-0.001	0.008^{**}	-0.068	-0.001
	(0.001)	(0.001)	(0.001)	(0.003)	(0.129)	(0.002)
nupw	-0.014^{**}	-0.014^{**}	-0.014^{**}	0.039	-1.353	-0.019
	(0.006)	(0.006)	(0.006)	(0.027)	(0.978)	(0.015)
factor(birthorder)1	0.005	0.004	0.018	-0.079^{**}	0.257	0.004
	(0.011)	(0.011)	(0.027)	(0.032)	(0.716)	(0.011)
factor(birthorder)2	0.002	0.002	0.012	-0.061^{**}	0.106	0.002
	(0.010)	(0.010)	(0.020)	(0.028)	(0.720)	(0.011)
factor(birthorder)3	-0.005	-0.005	0.001	-0.029	-0.056	-0.001
	(0.011)	(0.011)	(0.016)	(0.028)	(0.768)	(0.011)
motheragefirstchild	-0.001	-0.001	-0.000	0.002	-0.083	-0.001
	(0.001)	(0.001)	(0.001)	(0.002)	(0.089)	(0.001)
spousagegap	-0.002^{***}	-0.002^{***}	-0.002^{**}	-0.003^{*}	-0.240^{**}	-0.003^{**}
	(0.001)	(0.001)	(0.001)	(0.002)	(0.095)	(0.002)
fatherliterateTRUE	0.015	0.015	0.014	0.013	0.863	0.017
	(0.032)	(0.032)	(0.032)	(0.039)	(1.095)	(0.028)
motherliterateTRUE	-0.012	-0.012	-0.007	0.675^{***}	-0.357	-0.004
	(0.020)	(0.022)	(0.024)	(0.250)	(2.014)	(0.022)
nbro		-0.001				
		(0.004)				
nsis		-0.000				
		(0.003)				
R^2	0.206	0.206	0.204	0.241		
Adj. R^2	0.190	0.190	0.189	0.226		
Num. obs.	1378	1378	1378	1378	1378	1378
RMSE	0.125	0.125	0.125	0.294		
AIC					228.034	228.034
BIC					369.200	369.200
Log Likelihood					-87.017	-87.017
Deviance					174.034	174.034

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 10: mos jasenica 1884, enrolment

	OLS	OLS	IV	OLS-lit	Logit-enrol	Mfx
(Intercept)	-0.020	-0.020	0.251	-0.067	-25.594^{***}	-0.546^{***}
	(0.082)	(0.082)	(0.231)	(0.097)	(2.231)	(0.128)
nsib	0.009		-0.045	0.002	0.537^{**}	0.011^{**}
	(0.006)		(0.044)	(0.008)	(0.266)	(0.006)
age	-0.002	-0.002	0.006	0.002	-0.112	-0.002
	(0.003)	(0.002)	(0.008)	(0.003)	(0.132)	(0.003)
maleTRUE	0.048^{***}	0.048^{***}	0.041^{***}	0.077^{***}	3.345^{***}	0.051^{***}
	(0.013)	(0.013)	(0.015)	(0.018)	(1.168)	(0.012)
nserv	0.089^{**}	0.089^{**}	0.087^{**}	0.101^{**}	0.649^{*}	0.014
	(0.042)	(0.042)	(0.044)	(0.045)	(0.394)	(0.009)
urbanTRUE	-0.031^{*}	-0.031^{*}	-0.048^{*}	-0.031	-17.119^{***}	-0.034^{***}
	(0.017)	(0.017)	(0.024)	(0.022)	(0.597)	(0.006)
nlat	0.001	0.001	0.001	0.003	0.072	0.002
	(0.003)	(0.003)	(0.003)	(0.005)	(0.067)	(0.001)
nupw	0.035^{**}	0.035^{**}	0.037^{**}	0.042^{*}	1.124^{**}	0.024^{**}
	(0.017)	(0.017)	(0.018)	(0.023)	(0.471)	(0.012)
factor(birthorder)1	-0.014	-0.014	-0.258	-0.064	1.509	0.036
	(0.090)	(0.090)	(0.214)	(0.091)	(1.602)	(0.043)
factor(birthorder)2	-0.032	-0.032	-0.231	-0.065	0.585	0.013
	(0.088)	(0.088)	(0.180)	(0.090)	(1.629)	(0.040)
factor(birthorder)3	-0.042	-0.042	-0.184	-0.049	-0.210	-0.004
	(0.078)	(0.078)	(0.137)	(0.081)	(1.053)	(0.021)
factor(birthorder)4	-0.031	-0.031	-0.126	-0.037	-0.270	-0.005
	(0.089)	(0.090)	(0.115)	(0.093)	(1.277)	(0.024)
motheragefirstchild	-0.001	-0.001	-0.000	0.001	-0.117	-0.002
	(0.001)	(0.001)	(0.002)	(0.002)	(0.072)	(0.002)
spousagegap	0.002^{*}	0.002^{*}	0.002^{*}	0.001	0.082^{*}	0.002^{*}
	(0.001)	(0.001)	(0.001)	(0.002)	(0.044)	(0.001)
fatherliterateTRUE	-0.015	-0.015	-0.013	0.066	-0.004	-0.000
	(0.014)	(0.014)	(0.018)	(0.073)	(1.186)	(0.025)
fatherreligionmuslim	0.012	0.012	-0.008	0.019	0.475	0.010
	(0.029)	(0.029)	(0.040)	(0.030)	(0.530)	(0.011)
fatherreligionorthodox	-0.030	-0.030	-0.099	0.068	-17.859^{***}	-0.031^{***}
	(0.023)	(0.023)	(0.069)	(0.102)	(1.046)	(0.006)
nbro		0.009				
		(0.010)				
nsis		0.010				
		(0.006)				
R^2	0.138	0.138	0.011	0.126		
Adj. R^2	0.114	0.112	-0.017	0.101		
Num. obs.	680	680	680	680	680	680
RMSE	0.163	0.163	0.175	0.201		
AIC					135.728	135.728
BIC					221.648	221.648
Log Likelihood					-48.864	-48.864
Deviance					97.728	97.728

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 11: mos kruja 1918, enrolment

	OLS	OLS	IV	Logit	Mfx
(Intercept)	-0.284^{*}	-0.288^{*}	-0.284^{*}	-15.382^{***}	-2.749^{***}
	(0.159)	(0.160)	(0.159)	(1.406)	(0.258)
nsib	-0.005		-0.005	-0.025	-0.005
	(0.006)		(0.006)	(0.033)	(0.006)
age	0.017^{***}	0.017^{***}	0.017^{***}	0.092^{***}	0.016^{***}
	(0.002)	(0.002)	(0.002)	(0.012)	(0.002)
maleTRUE	0.042^{***}	0.042^{***}	0.042^{***}	0.235^{***}	0.042^{***}
	(0.010)	(0.010)	(0.010)	(0.058)	(0.010)
nserv	0.054	0.054	0.054	0.267	0.048
	(0.039)	(0.039)	(0.039)	(0.181)	(0.032)
factor(birthorder)1	0.005	0.004	0.005	0.119	0.021
	(0.132)	(0.132)	(0.132)	(1.089)	(0.196)
factor(birthorder)2	0.045	0.045	0.045	0.350	0.064
	(0.131)	(0.131)	(0.131)	(1.086)	(0.205)
factor(birthorder)3	0.069	0.068	0.069	0.478	0.092
	(0.131)	(0.130)	(0.131)	(1.083)	(0.221)
factor(birthorder)4	0.107	0.107	0.107	0.680	0.138
	(0.129)	(0.129)	(0.129)	(1.073)	(0.238)
factor(birthorder)5	0.101	0.101	0.101	0.653	0.133
	(0.128)	(0.128)	(0.128)	(1.063)	(0.239)
factor(birthorder)6	0.071	0.070	0.071	0.496	0.099
	(0.123)	(0.123)	(0.123)	(1.011)	(0.220)
nlat	0.041	0.040	0.041	0.196	0.035
	(0.044)	(0.044)	(0.044)	(0.205)	(0.037)
nupw	0.013	0.013	0.013	0.074	0.013
	(0.025)	(0.025)	(0.025)	(0.137)	(0.024)
motheragefirstchild	0.002	0.002	0.002	0.015	0.003
	(0.002)	(0.002)	(0.002)	(0.010)	(0.002)
spousagegap	0.000	0.000	0.000	0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.008)	(0.002)
fatherreligionother	0.056	0.054	0.056	0.331	0.064
	(0.127)	(0.127)	(0.127)	(0.688)	(0.141)
fatherreligionprotestant	0.026	0.026	0.026	0.183	0.031
	(0.054)	(0.054)	(0.054)	(0.365)	(0.060)
motherreligionother	0.079	0.081	0.079	0.478	0.095
	(0.134)	(0.135)	(0.134)	(0.747)	(0.161)
motherreligionprotestant	0.062	0.063	0.062	0.415	0.067
	(0.061)	(0.062)	(0.061)	(0.447)	(0.064)
nbro		-0.003			
		(0.008)			
nsis		-0.007			
		(0.008)			
R^2	0.029	0.029	0.029		
Adj. R^2	0.024	0.024	0.024		
Num. obs.	6848	6848	6848	6848	6848
AIC				7471.216	7471.216
BIC				7703.495	7703.495
Log Likelihood				-3701.608	-3701.608
Deviance				7403.216	7403.216

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 12: mos-rostock-1900, enrolment

	OLS	OLS	IV	Logit	Mfx
(Intercept)	-0.007	-0.009	0.386	-2.269^{***}	-0.496^{***}
	(0.149)	(0.149)	(0.327)	(0.708)	(0.156)
nsib	0.010		-0.049	0.046	0.010
	(0.009)		(0.046)	(0.039)	(0.009)
age	0.008^{**}	0.008^{**}	0.014^{**}	0.035^{**}	0.008^{**}
	(0.004)	(0.004)	(0.006)	(0.017)	(0.004)
maleTRUE	0.135^{***}	0.135^{***}	0.135^{***}	0.604^{***}	0.134^{***}
	(0.018)	(0.018)	(0.018)	(0.082)	(0.018)
nserv	0.016	0.016	0.024^{**}	0.068	0.015
	(0.010)	(0.010)	(0.012)	(0.044)	(0.010)
nlat	-0.012	-0.010	-0.001	-0.057	-0.012
	(0.050)	(0.050)	(0.048)	(0.227)	(0.050)
nupw	0.095^{*}	0.095^{*}	0.094^{*}	0.427^{*}	0.093^{*}
	(0.055)	(0.054)	(0.056)	(0.242)	(0.053)
factor(birthorder)1	0.064	0.058	-0.206	0.292	0.064
	(0.087)	(0.086)	(0.223)	(0.394)	(0.085)
factor(birthorder)2	0.042	0.037	-0.179	0.197	0.043
	(0.084)	(0.083)	(0.189)	(0.382)	(0.084)
factor(birthorder)3	0.083	0.078	-0.089	0.377	0.083
	(0.082)	(0.081)	(0.155)	(0.374)	(0.083)
factor(birthorder)4	0.059	0.054	-0.062	0.272	0.060
	(0.075)	(0.075)	(0.119)	(0.345)	(0.077)
factor(birthorder)5	-0.080	-0.081	-0.142^{*}	-0.378	-0.080
	(0.068)	(0.067)	(0.084)	(0.309)	(0.063)
motheragefirstchild	0.001	0.001	-0.003	0.003	0.001
	(0.003)	(0.003)	(0.004)	(0.013)	(0.003)
spousagegap	-0.004^{*}	-0.004^{*}	-0.004^{*}	-0.017^{*}	-0.004^{*}
	(0.002)	(0.002)	(0.002)	(0.010)	(0.002)
nbro		0.019			
		(0.011)			
nsis		0.001			
		(0.012)			
R^2	0.105	0.106	0.082		
Adj. R^2	0.074	0.075	0.051		
Num. obs.	3224	3224	3224	3224	3224
RMSE	0.476	0.476	0.482		
AIC				4246.058	4246.058
BIC				4896.445	4896.445
Log Likelihood				-2016.029	-2016.029
Deviance				4032.058	4032.058

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 13: mos rostock 1867, enrolment

	OLS	OLS	IV	Logit	Mfx
(Intercept)	0.267	0.269	0.495	-15.261^{***}	-0.974^{***}
	(0.260)	(0.262)	(0.344)	(3.426)	(0.272)
nsib	-0.019		-0.062	-0.121	-0.008
	(0.018)		(0.046)	(0.241)	(0.016)
age	0.026^{***}	0.026^{***}	0.027^{**}	0.417^{***}	0.027^{*}
	(0.010)	(0.010)	(0.010)	(0.155)	(0.014)
maleTRUE	0.027	0.026	0.031	0.364	0.023
	(0.065)	(0.065)	(0.066)	(0.860)	(0.054)
nserv	-0.059^{**}	-0.059^{**}	-0.036	-1.041^{***}	-0.066^{**}
	(0.028)	(0.029)	(0.035)	(0.393)	(0.030)
factor(birthorder)2	-0.016	-0.017	0.016	-0.084	-0.005
	(0.066)	(0.066)	(0.075)	(1.298)	(0.082)
factor(birthorder)3	0.082	0.083	0.124	1.527	0.112
	(0.066)	(0.066)	(0.079)	(1.179)	(0.078)
factor(birthorder)4	0.079	0.078	0.132	1.339	0.105
	(0.111)	(0.111)	(0.114)	(2.039)	(0.180)
factor(birthorder)5	-0.020	-0.026	0.025	-14.780^{***}	-0.102^{***}
	(0.092)	(0.097)	(0.103)	(1.721)	(0.023)
factor(birthorder)6	-0.020	-0.038	0.000	-14.281^{***}	-0.101^{***}
	(0.145)	(0.148)	(0.144)	(2.319)	(0.023)
nextd	-0.003	-0.003	-0.019	0.060	0.004
	(0.022)	(0.022)	(0.027)	(0.630)	(0.040)
motheragefirstchild	-0.025^{***}	-0.025^{***}	-0.030^{***}	-0.444^{***}	-0.028^{*}
	(0.009)	(0.009)	(0.011)	(0.159)	(0.015)
spousagegap	-0.002	-0.002	-0.005	-0.026	-0.002
	(0.004)	(0.004)	(0.004)	(0.031)	(0.002)
fatherberstelDienstpersonal	0.213^{**}	0.209^{**}	0.236^{**}	16.785^{***}	0.736^{***}
	(0.103)	(0.100)	(0.102)	(1.397)	(0.028)
fatherberstelHaendler/Haendlerin	0.358^{**}	0.346^{**}	0.346^{***}	20.029^{***}	0.787^{***}
	(0.143)	(0.145)	(0.126)	(1.581)	(0.027)
fatherberstelMilitaers	-0.010	-0.028	-0.098	0.911	0.070
	(0.097)	(0.101)	(0.131)	(1.850)	(0.167)
fatherberstelUnbekannt	0.234^{**}	0.222^{**}	0.240^{**}	18.189^{***}	0.275^{***}
	(0.096)	(0.094)	(0.093)	(1.332)	(0.028)
nbro		-0.024			
		(0.020)			
nsis		-0.013			
		(0.023)			
R^2	0.179	0.180	0.153		
Adj. R^2	0.062	0.055	0.032		
Num. obs.	129	129	129	129	129
RMSE	0.293	0.294	0.297		
AIC				89.035	89.035
BIC				137.652	137.652
Log Likelihood				-27.517	-27.517
Deviance				55.035	55.035

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 14: mos san marcello 1827, enrolment

	OLS	OLS	IV	Logit	Mfx
(Intercept)	3.347^{***}	3.347^{***}	3.272^{***}	13.821^{***}	2.684^{***}
	(0.074)	(0.074)	(0.106)	(0.398)	(0.091)
nsib	-0.014^{***}		0.001	-0.081^{***}	-0.016^{***}
	(0.002)		(0.016)	(0.011)	(0.002)
age	-0.214^{***}	-0.214^{***}	-0.216^{***}	-1.036^{***}	-0.201^{***}
	(0.004)	(0.004)	(0.005)	(0.023)	(0.006)
maleTRUE	0.053^{***}	0.053^{***}	0.053^{***}	0.266^{***}	0.052^{***}
	(0.007)	(0.007)	(0.007)	(0.035)	(0.007)
nserv	0.090^{***}	0.090^{***}	0.087^{***}	0.725^{***}	0.141^{***}
	(0.006)	(0.006)	(0.006)	(0.057)	(0.012)
urbanTRUE	0.013	0.013	0.017	0.067	0.013
	(0.013)	(0.013)	(0.014)	(0.064)	(0.013)
factor(birthorder)2	0.001	0.001	-0.008	0.006	0.001
	(0.008)	(0.008)	(0.012)	(0.043)	(0.008)
factor(birthorder)3	0.020^{**}	0.020^{*}	-0.000	0.106^{**}	0.021^{**}
	(0.010)	(0.010)	(0.022)	(0.052)	(0.010)
factor(birthorder)4	0.062^{***}	0.062^{***}	0.032	0.314^{***}	0.061^{***}
	(0.013)	(0.013)	(0.034)	(0.068)	(0.013)
factor(birthorder)5	0.108^{***}	0.108^{***}	0.066	0.548^{***}	0.107^{***}
	(0.022)	(0.022)	(0.048)	(0.114)	(0.022)
factor(birthorder)6	0.219^{***}	0.219^{***}	0.162^{**}	1.190^{***}	0.224^{***}
	(0.043)	(0.043)	(0.070)	(0.229)	(0.039)
factor(birthorder)7	0.153^{*}	0.153^{*}	0.080	0.847^{*}	0.163^{**}
	(0.088)	(0.088)	(0.114)	(0.441)	(0.081)
factor(birthorder)8	0.503^{***}	0.503^{***}	0.426^{***}	11.697^{***}	0.523^{***}
	(0.062)	(0.062)	(0.099)	(0.638)	(0.004)
nlat	0.012	0.012	0.014	0.038	0.007
	(0.012)	(0.012)	(0.012)	(0.060)	(0.012)
nupw	0.055^{***}	0.055^{***}	0.055^{***}	0.272^{***}	0.053^{***}
	(0.017)	(0.017)	(0.017)	(0.089)	(0.017)
motheragefirstchild	0.005^{***}	0.005^{***}	0.006^{***}	0.020^{***}	0.004^{***}
	(0.001)	(0.001)	(0.002)	(0.005)	(0.001)
spousagegap	0.003^{***}	0.003^{***}	0.003^{***}	0.011^{***}	0.002^{***}
	(0.001)	(0.001)	(0.001)	(0.004)	(0.001)
nbro		-0.014^{***}			
		(0.003)			
nsis		-0.015^{***}			
		(0.003)			
R^2	0.213	0.213	0.210		
Adj. R^2	0.210	0.210	0.208		
Num. obs.	16471	16471	16471	16471	16471
RMSE	0.444	0.444	0.445		
AIC				18887.762	18887.762
BIC				19280.940	19280.940
Log Likelihood				-9392.881	-9392.881
Deviance				18785.762	18785.762

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 15: napp scotland 1881 10pc, enrolment

	OLS	OLS	IV	OLS-lit	Logit-enrol	Mfx
(Intercept)	-0.226^{***}	-0.226^{***}	-0.074	0.295^{**}	-3.465^{***}	-0.670^{***}
	(0.061)	(0.061)	(0.122)	(0.136)	(0.285)	(0.056)
nsib	-0.001		-0.014	-0.001^{*}	-0.012^{*}	-0.002^{*}
	(0.001)		(0.009)	(0.001)	(0.007)	(0.001)
age	0.032^{***}	0.032^{***}	0.035^{***}	0.010^{***}	0.170^{***}	0.033^{***}
	(0.001)	(0.001)	(0.002)	(0.001)	(0.004)	(0.001)
maleTRUE	-0.014^{***}	-0.014^{***}	-0.014^{***}	-0.016^{***}	-0.074^{***}	-0.014^{***}
	(0.003)	(0.003)	(0.003)	(0.002)	(0.015)	(0.003)
urbanTRUE	0.003	0.003	-0.001	0.021^{***}	0.017	0.003
	(0.005)	(0.005)	(0.006)	(0.002)	(0.025)	(0.005)
nserv	0.012^{***}	0.012^{***}	0.011^{**}	-0.000	0.072^{**}	0.014^{**}
	(0.005)	(0.005)	(0.005)	(0.002)	(0.030)	(0.006)
nlat	0.006	0.006	0.004	0.006^{*}	0.031	0.006
	(0.005)	(0.005)	(0.005)	(0.004)	(0.023)	(0.004)
nupw	0.014^{**}	0.014^{**}	0.014^{**}	0.005	0.074^{**}	0.014^{**}
	(0.006)	(0.006)	(0.006)	(0.004)	(0.033)	(0.006)
factor(birthorder)1	0.058	0.058	-0.052	0.099	0.144	0.028
	(0.056)	(0.056)	(0.094)	(0.134)	(0.259)	(0.049)
factor(birthorder)2	0.084	0.084	-0.016	0.105	0.284	0.054
	(0.056)	(0.056)	(0.089)	(0.134)	(0.258)	(0.048)
factor(birthorder)3	0.094^{*}	0.094^{*}	0.006	0.103	0.337	0.063
	(0.056)	(0.056)	(0.083)	(0.134)	(0.257)	(0.046)
factor(birthorder)4	0.100^{*}	0.100^{*}	0.024	0.106	0.371	0.069
	(0.056)	(0.056)	(0.077)	(0.134)	(0.256)	(0.045)
factor(birthorder)5	0.090	0.090	0.025	0.116	0.325	0.060
	(0.056)	(0.056)	(0.072)	(0.134)	(0.256)	(0.045)
factor(birthorder)6	0.086	0.086	0.033	0.119	0.318	0.059
	(0.056)	(0.056)	(0.067)	(0.134)	(0.255)	(0.045)
factor(birthorder)7	0.053	0.053	0.012	0.131	0.179	0.034
	(0.056)	(0.056)	(0.063)	(0.135)	(0.256)	(0.047)
factor(birthorder)8	0.021	0.022	-0.007	0.119	0.043	0.008
	(0.057)	(0.057)	(0.061)	(0.133)	(0.261)	(0.050)
factor(birthorder)9	0.018	0.018	0.001	0.083	0.051	0.010
	(0.058)	(0.058)	(0.060)	(0.132)	(0.265)	(0.050)
motheragefirstchild	0.002^{***}	0.002^{***}	0.001	0.001	0.010^{***}	0.002^{***}
	(0.001)	(0.001)	(0.001)	(0.000)	(0.003)	(0.000)
spousagegap	0.000	0.000	-0.000	-0.000	0.001	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)
fatherliterateTRUE	0.082^{***}	0.082^{***}	0.081^{***}	0.134^{***}	0.373^{***}	0.076^{***}
	(0.008)	(0.008)	(0.008)	(0.009)	(0.038)	(0.008)
motherliterateTRUE	0.110^{***}	0.110^{***}	0.108^{***}	0.171^{***}	0.506^{***}	0.104^{***}
	(0.008)	(0.008)	(0.008)	(0.008)	(0.036)	(0.008)
log1p(fatherincome)	0.036^{***}	0.036^{***}	0.034^{***}	0.004^{*}	0.179^{***}	0.035^{***}
	(0.004)	(0.004)	(0.004)	(0.002)	(0.020)	(0.004)
log1p(motherincome)	-0.004	-0.004	-0.006	-0.013^{***}	-0.021	-0.004
	(0.005)	(0.005)	(0.005)	(0.004)	(0.023)	(0.004)
nbro		-0.002				
		(0.002)				
nsis		-0.001				
		(0.002)				
R^2	0.122	0.122	0.121	0.286		
Adj. R^2	0.122	0.122	0.120	0.285		
Num. obs.	88661	88661	88661	47631	88661	88661
RMSE	0.440	0.440	0.441	0.224		
AIC					101384.147	101384.147
BIC					102107.375	102107.375
Log Likelihood					-50615.074	-50615.074
Deviance					101230.147	101230.147

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Regional and race controls included.

Table 16: napp usa 1900, enrolment

	OLS	OLS	IV	OLS-lit	Logit-enrol	Mfx
(Intercept)	0.319^{***}	0.319^{***}	0.170^{*}	0.515^{***}	-2.090^{***}	-0.197^{***}
	(0.057)	(0.057)	(0.098)	(0.120)	(0.331)	(0.031)
nsib	-0.003^{***}		0.009	-0.001^{**}	-0.045^{***}	-0.004^{***}
	(0.001)		(0.007)	(0.001)	(0.008)	(0.001)
age	0.014^{***}	0.014^{***}	0.012^{***}	0.006^{***}	0.161^{***}	0.015^{***}
	(0.000)	(0.000)	(0.001)	(0.000)	(0.005)	(0.000)
maleTRUE	-0.009^{***}	-0.009^{***}	-0.008^{***}	-0.013^{***}	-0.096^{***}	-0.009^{***}
	(0.002)	(0.002)	(0.002)	(0.001)	(0.018)	(0.002)
urbanTRUE	0.006^{***}	0.006^{***}	0.010^{***}	0.017^{***}	0.046^{*}	0.004^{*}
	(0.002)	(0.002)	(0.003)	(0.002)	(0.026)	(0.002)
nserv	0.007^{***}	0.007^{***}	0.008^{***}	0.001	0.120^{***}	0.011^{***}
	(0.003)	(0.003)	(0.003)	(0.001)	(0.044)	(0.004)
nlat	0.005^{*}	0.005^{*}	0.006^{**}	0.004^{*}	0.044	0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.029)	(0.003)
nupw	0.013^{***}	0.013^{***}	0.014^{***}	0.006^{**}	0.154^{***}	0.015^{***}
	(0.003)	(0.003)	(0.003)	(0.002)	(0.040)	(0.004)
factor(birthorder)1	0.035	0.035	0.143^{*}	0.044	-0.183	-0.018
	(0.055)	(0.055)	(0.079)	(0.119)	(0.309)	(0.030)
factor(birthorder)2	0.054	0.055	0.152^{**}	0.049	0.040	0.004
	(0.055)	(0.055)	(0.076)	(0.119)	(0.308)	(0.029)
factor(birthorder)3	0.059	0.059	0.145^{**}	0.050	0.095	0.009
	(0.055)	(0.055)	(0.071)	(0.119)	(0.306)	(0.028)
factor(birthorder)4	0.066	0.066	0.140^{**}	0.055	0.182	0.016
	(0.055)	(0.055)	(0.068)	(0.119)	(0.306)	(0.026)
factor(birthorder)5	0.069	0.069	0.132^{**}	0.059	0.230	0.020
	(0.055)	(0.055)	(0.064)	(0.119)	(0.305)	(0.025)
factor(birthorder)6	0.059	0.060	0.110^{*}	0.062	0.178	0.016
	(0.055)	(0.055)	(0.062)	(0.119)	(0.306)	(0.026)
factor(birthorder)7	0.053	0.054	0.092	0.055	0.172	0.015
	(0.055)	(0.055)	(0.060)	(0.119)	(0.310)	(0.026)
factor(birthorder)8	0.032	0.033	0.061	0.045	0.060	0.006
	(0.056)	(0.056)	(0.059)	(0.121)	(0.316)	(0.029)
factor(birthorder)9	0.017	0.017	0.034	-0.037	0.047	0.004
	(0.055)	(0.055)	(0.057)	(0.107)	(0.316)	(0.029)
motheragefirstchild	0.001^{***}	0.001^{***}	0.002^{***}	0.001^{**}	0.010^{***}	0.001^{***}
	(0.000)	(0.000)	(0.001)	(0.000)	(0.003)	(0.000)
spousagegap	0.000	0.000	0.000	0.000	0.001	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)
fatherliterateTRUE	0.078^{***}	0.078^{***}	0.079^{***}	0.099^{***}	0.495^{***}	0.053^{***}
	(0.006)	(0.006)	(0.006)	(0.007)	(0.038)	(0.005)
motherliterateTRUE	0.105^{***}	0.105^{***}	0.108^{***}	0.154^{***}	0.716^{***}	0.081^{***}
	(0.006)	(0.006)	(0.006)	(0.007)	(0.037)	(0.005)
log1p(fatherincome)	0.016^{***}	0.016^{***}	0.018^{***}	0.005^{***}	0.184^{***}	0.017^{***}
	(0.002)	(0.002)	(0.002)	(0.001)	(0.020)	(0.002)
log1p(motherincome)	-0.003	-0.003	-0.002	-0.005^{**}	-0.019	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.018)	(0.002)
nbro		-0.004^{***}				
		(0.001)				
nsis		-0.002^{*}				
		(0.001)				
R^2	0.107	0.107	0.104	0.237		
Adj. R^2	0.106	0.106	0.103	0.236		
Num. obs.	132539	132539	132539	70773	132539	132539
RMSE	0.309	0.309	0.309	0.182		
AIC					85791.193	85791.193
BIC					86613.942	86613.942
Log Likelihood					-42811.596	-42811.596
Deviance					85623.193	85623.193

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Regional and race controls included.

Table 17: napp usa 1910, enrolment

	OLS	OLS	IV	Logit	Mfx
(Intercept)	-0.272^{***}	-0.273^{***}	0.160	-3.761^{***}	-0.719^{***}
	(0.090)	(0.090)	(0.233)	(0.436)	(0.084)
nsib	0.018^{***}		-0.019	0.092^{***}	0.018^{***}
	(0.003)		(0.019)	(0.014)	(0.003)
age	0.008^{***}	0.008^{***}	0.017^{***}	0.041^{***}	0.008^{***}
	(0.001)	(0.001)	(0.005)	(0.006)	(0.001)
maleTRUE	0.010^{**}	0.010^{**}	0.010^{**}	0.053^{**}	0.010^{**}
	(0.005)	(0.005)	(0.005)	(0.025)	(0.005)
urbanTRUE	-0.004	-0.005	-0.017	-0.031	-0.006
	(0.010)	(0.010)	(0.012)	(0.059)	(0.011)
nlat	0.023^{**}	0.022^{**}	0.021^{**}	0.126^{**}	0.024^{**}
	(0.010)	(0.010)	(0.010)	(0.056)	(0.011)
nupw	0.048^{***}	0.048^{***}	0.044^{***}	0.283^{***}	0.054^{***}
	(0.012)	(0.012)	(0.012)	(0.075)	(0.014)
factor(birthorder)1	0.215^{***}	0.216^{***}	-0.120	1.033^{***}	0.179^{***}
	(0.081)	(0.080)	(0.184)	(0.387)	(0.058)
factor(birthorder)2	0.247^{***}	0.248^{***}	-0.056	1.209^{***}	0.205^{***}
	(0.080)	(0.080)	(0.170)	(0.385)	(0.054)
factor(birthorder)3	0.227^{***}	0.229^{***}	-0.041	1.106^{***}	0.187^{***}
	(0.080)	(0.080)	(0.155)	(0.382)	(0.054)
factor(birthorder)4	0.205^{**}	0.206^{***}	-0.030	0.989^{***}	0.167^{***}
	(0.080)	(0.079)	(0.140)	(0.380)	(0.054)
factor(birthorder)5	0.174^{**}	0.176^{**}	-0.027	0.834^{**}	0.142^{**}
	(0.079)	(0.079)	(0.126)	(0.378)	(0.055)
factor(birthorder)6	0.125	0.127	-0.043	0.596	0.105^{*}
	(0.079)	(0.079)	(0.114)	(0.376)	(0.060)
factor(birthorder)7	0.076	0.079	-0.055	0.366	0.067
	(0.079)	(0.079)	(0.102)	(0.378)	(0.065)
factor(birthorder)8	0.022	0.024	-0.074	0.113	0.021
	(0.080)	(0.080)	(0.093)	(0.380)	(0.071)
factor(birthorder)9	-0.015	-0.013	-0.073	-0.066	-0.013
	(0.077)	(0.077)	(0.083)	(0.369)	(0.072)
motheragefirstchild	0.002^{***}	0.002^{***}	0.000	0.012^{***}	0.002^{***}
	(0.001)	(0.001)	(0.001)	(0.005)	(0.001)
spousagegap	0.002^{***}	0.002^{***}	0.001^{*}	0.009^{**}	0.002^{**}
	(0.001)	(0.001)	(0.001)	(0.004)	(0.001)
fatherliterateTRUE	0.093^{***}	0.093^{***}	0.092^{***}	0.426^{***}	0.085^{***}
	(0.015)	(0.015)	(0.015)	(0.070)	(0.015)
motherliterateTRUE	0.116^{***}	0.116^{***}	0.110^{***}	0.529^{***}	0.107^{***}
	(0.013)	(0.013)	(0.013)	(0.056)	(0.012)
log1p(fatherincome)	0.030^{***}	0.030^{***}	0.028^{***}	0.151^{***}	0.029^{***}
	(0.006)	(0.006)	(0.006)	(0.032)	(0.006)
log1p(motherincome)	-0.062	-0.063	-0.065	-0.300	-0.057
	(0.057)	(0.058)	(0.055)	(0.245)	(0.047)
nsis		0.022^{***}			
		(0.003)			
nbro		0.014^{***}			
		(0.003)			
R^2	0.149	0.149	0.137		
Adj. R^2	0.148	0.148	0.136		
Num. obs.	33889	33889	33889	33889	33889
RMSE	0.438	0.438	0.441		
AIC				38374.089	38374.089
BIC				38879.939	38879.939
Log Likelihood				-19127.044	-19127.044
Deviance				38254.089	38254.089

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Regional and race controls included.

Table 18: napp usa 1850, enrolment

	OLS	OLS	IV	Logit	Mfx
(Intercept)	0.083	0.084	0.350	-2.224^{***}	-0.403^{***}
	(0.081)	(0.081)	(0.213)	(0.400)	(0.073)
nsib	0.011^{***}	0.012^{***}	-0.012	0.058^{***}	0.010^{***}
	(0.002)	(0.003)	(0.017)	(0.012)	(0.002)
age	0.014^{***}	0.014^{***}	0.019^{***}	0.081^{***}	0.015^{***}
	(0.001)	(0.001)	(0.004)	(0.005)	(0.001)
maleTRUE	0.011^{***}	0.011^{***}	0.011^{***}	0.062^{***}	0.011^{***}
	(0.004)	(0.004)	(0.004)	(0.022)	(0.004)
urbanTRUE	-0.019^{**}	-0.019^{**}	-0.027^{***}	-0.115^{**}	-0.021^{**}
	(0.008)	(0.008)	(0.010)	(0.046)	(0.009)
nserv	0.030^{***}	0.030^{***}	0.031^{***}	0.230^{***}	0.042^{***}
	(0.010)	(0.010)	(0.010)	(0.076)	(0.014)
nlat	-0.018^{*}	-0.018^{*}	-0.021^{**}	-0.098^{*}	-0.018^{*}
	(0.010)	(0.010)	(0.010)	(0.053)	(0.010)
nupw	0.032^{***}	0.032^{***}	0.030^{***}	0.196^{***}	0.036^{***}
	(0.010)	(0.010)	(0.010)	(0.065)	(0.012)
factor(birthorder)1	0.021	0.020	-0.182	0.113	0.020
	(0.072)	(0.072)	(0.166)	(0.355)	(0.063)
factor(birthorder)2	0.047	0.046	-0.137	0.262	0.046
	(0.072)	(0.072)	(0.153)	(0.352)	(0.061)
factor(birthorder)3	0.038	0.037	-0.126	0.211	0.037
	(0.071)	(0.071)	(0.140)	(0.350)	(0.060)
factor(birthorder)4	0.028	0.027	-0.116	0.153	0.027
	(0.071)	(0.071)	(0.127)	(0.349)	(0.061)
factor(birthorder)5	0.018	0.018	-0.105	0.106	0.019
	(0.071)	(0.071)	(0.114)	(0.347)	(0.061)
factor(birthorder)6	-0.003	-0.004	-0.104	-0.005	-0.001
	(0.071)	(0.071)	(0.102)	(0.346)	(0.063)
factor(birthorder)7	-0.041	-0.042	-0.122	-0.192	-0.036
	(0.071)	(0.071)	(0.092)	(0.344)	(0.066)
factor(birthorder)8	-0.059	-0.059	-0.119	-0.274	-0.052
	(0.071)	(0.071)	(0.084)	(0.345)	(0.068)
factor(birthorder)9	-0.085	-0.085	-0.123	-0.393	-0.075
	(0.071)	(0.071)	(0.077)	(0.341)	(0.069)
motheragefirstchild	0.001	0.001	-0.000	0.006	0.001
	(0.001)	(0.001)	(0.001)	(0.004)	(0.001)
spousagegap	0.001	0.001	0.001	0.004	0.001
	(0.001)	(0.001)	(0.001)	(0.003)	(0.001)
fatherliterateTRUE	0.103^{***}	0.103^{***}	0.102^{***}	0.484^{***}	0.094^{***}
	(0.014)	(0.014)	(0.014)	(0.063)	(0.013)
motherliterateTRUE	0.035^{***}	0.035^{***}	0.031^{***}	0.178^{***}	0.033^{***}
	(0.011)	(0.011)	(0.012)	(0.055)	(0.010)
log1p(fatherincome)	0.026^{***}	0.026^{***}	0.024^{***}	0.136^{***}	0.025^{***}
	(0.005)	(0.005)	(0.006)	(0.028)	(0.005)
log1p(motherincome)	0.005	0.005	0.004	0.028	0.005
	(0.006)	(0.006)	(0.006)	(0.033)	(0.006)
nbro		-0.001			
		(0.003)			
R^2	0.129	0.129	0.125		
Adj. R^2	0.128	0.128	0.123		
Num. obs.	44350	44350	44350	44350	44350
RMSE	0.426	0.426	0.427		
AIC				48186.022	48186.022
BIC				48795.012	48795.012
Log Likelihood				-24023.011	-24023.011
Deviance				48046.022	48046.022

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Regional and race controls included.

Table 19: napp usa 1860, enrolment

	OLS	OLS	IV	OLS-lit	Logit-enrol	Mfx
(Intercept)	-0.224^{***}	-0.224^{***}	0.176	0.229	-3.866^{***}	-0.665^{***}
	(0.080)	(0.079)	(0.168)	(0.148)	(0.422)	(0.073)
nsib	0.001		-0.035^{***}	-0.003^{***}	0.003	0.001
	(0.002)		(0.013)	(0.001)	(0.010)	(0.002)
age	0.023^{***}	0.023^{***}	0.030^{***}	0.005^{***}	0.134^{***}	0.023^{***}
	(0.001)	(0.001)	(0.003)	(0.001)	(0.005)	(0.001)
maleTRUE	-0.004	-0.004	-0.004	-0.012^{***}	-0.021	-0.004
	(0.003)	(0.003)	(0.003)	(0.003)	(0.020)	(0.003)
urbanTRUE	0.017^{***}	0.017^{***}	0.011^{*}	0.041^{***}	0.104^{***}	0.018^{***}
	(0.006)	(0.006)	(0.007)	(0.004)	(0.035)	(0.006)
nserv	0.037^{***}	0.037^{***}	0.033^{***}	0.001	0.245^{***}	0.042^{***}
	(0.006)	(0.006)	(0.007)	(0.004)	(0.044)	(0.008)
nlat	0.002	0.002	-0.001	0.012^{*}	0.004	0.001
	(0.007)	(0.007)	(0.008)	(0.006)	(0.043)	(0.007)
nupw	0.019^{**}	0.019^{**}	0.017^{**}	0.008	0.108^{**}	0.019^{**}
	(0.008)	(0.008)	(0.008)	(0.006)	(0.047)	(0.008)
factor(birthorder)1	0.027	0.028	-0.293^{**}	0.068	0.098	0.017
	(0.075)	(0.075)	(0.141)	(0.145)	(0.389)	(0.066)
factor(birthorder)2	0.062	0.063	-0.227^{*}	0.071	0.306	0.052
	(0.075)	(0.075)	(0.132)	(0.145)	(0.387)	(0.064)
factor(birthorder)3	0.065	0.066	-0.191	0.071	0.322	0.054
	(0.075)	(0.074)	(0.122)	(0.145)	(0.386)	(0.063)
factor(birthorder)4	0.062	0.063	-0.160	0.074	0.309	0.052
	(0.074)	(0.074)	(0.112)	(0.145)	(0.385)	(0.062)
factor(birthorder)5	0.050	0.051	-0.140	0.063	0.253	0.042
	(0.074)	(0.074)	(0.104)	(0.145)	(0.384)	(0.062)
factor(birthorder)6	0.027	0.029	-0.130	0.027	0.141	0.024
	(0.074)	(0.074)	(0.096)	(0.145)	(0.385)	(0.064)
factor(birthorder)7	0.019	0.020	-0.105	0.026	0.100	0.017
	(0.075)	(0.075)	(0.090)	(0.149)	(0.386)	(0.065)
factor(birthorder)8	0.014	0.016	-0.073	0.097	0.065	0.011
	(0.076)	(0.076)	(0.084)	(0.154)	(0.394)	(0.067)
factor(birthorder)9	0.085	0.086	0.038	0.063	0.467	0.076
	(0.078)	(0.078)	(0.081)	(0.123)	(0.406)	(0.062)
motheragefirstchild	0.001^{**}	0.001^{**}	-0.001	0.001^{*}	0.006^{*}	0.001^{*}
	(0.001)	(0.001)	(0.001)	(0.000)	(0.003)	(0.001)
spousagegap	0.000	0.000	0.000	0.001^{*}	0.003	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)
fatherliterateTRUE	0.080^{***}	0.080^{***}	0.075^{***}	0.163^{***}	0.449^{***}	0.082^{***}
	(0.010)	(0.010)	(0.010)	(0.012)	(0.053)	(0.010)
motherliterateTRUE	0.078^{***}	0.078^{***}	0.071^{***}	0.223^{***}	0.425^{***}	0.077^{***}
	(0.009)	(0.009)	(0.010)	(0.011)	(0.048)	(0.009)
log1p(fatherincome)	0.049^{***}	0.048^{***}	0.045^{***}	0.022^{***}	0.269^{***}	0.046^{***}
	(0.005)	(0.005)	(0.005)	(0.004)	(0.029)	(0.005)
log1p(motherincome)	0.006	0.006	0.002	-0.007	-0.004	-0.001
	(0.005)	(0.005)	(0.005)	(0.006)	(0.040)	(0.007)
nbro		-0.002				
		(0.002)				
nsis		0.003				
		(0.002)				
R^2	0.274	0.274	0.263	0.443		
Adj. R^2	0.273	0.273	0.262	0.442		
Num. obs.	62487	62487	62487	33785	62487	62487
RMSE	0.416	0.416	0.419	0.264		
AIC					65146.821	65146.821
BIC					65788.854	65788.854
Log Likelihood					-32502.411	-32502.411
Deviance					65004.821	65004.821

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Regional and race controls included.

Table 20: napp usa 1870, enrolment

	OLS	OLS	IV	OLS-lit	Logit-enrol	Mfx
(Intercept)	-0.148^{***}	-0.148^{***}	0.090	0.443^{***}	-3.212^{***}	-0.625^{***}
	(0.048)	(0.048)	(0.123)	(0.091)	(0.238)	(0.047)
nsib	0.005^{***}		-0.017^{*}	-0.005^{***}	0.024^{***}	0.005^{***}
	(0.001)		(0.010)	(0.001)	(0.006)	(0.001)
age	0.023^{***}	0.023^{***}	0.028^{***}	0.007^{***}	0.118^{***}	0.023^{***}
	(0.001)	(0.001)	(0.002)	(0.001)	(0.003)	(0.001)
maleTRUE	0.000	0.000	0.000	-0.013^{***}	0.000	0.000
	(0.002)	(0.002)	(0.002)	(0.002)	(0.012)	(0.002)
urbanTRUE	-0.014^{***}	-0.013^{***}	-0.019^{***}	0.040^{***}	-0.070^{***}	-0.014^{***}
	(0.005)	(0.005)	(0.006)	(0.003)	(0.025)	(0.005)
nserv	0.018^{***}	0.018^{***}	0.017^{***}	0.011^{***}	0.094^{***}	0.018^{***}
	(0.003)	(0.003)	(0.003)	(0.002)	(0.015)	(0.003)
nlat	0.024^{***}	0.024^{***}	0.021^{***}	0.008^{**}	0.118^{***}	0.023^{***}
	(0.004)	(0.004)	(0.004)	(0.003)	(0.019)	(0.004)
nupw	0.018^{***}	0.018^{***}	0.017^{***}	0.010^{**}	0.092^{***}	0.018^{***}
	(0.006)	(0.006)	(0.006)	(0.005)	(0.031)	(0.006)
factor(birthorder)1	0.055	0.055	-0.128	-0.149^{*}	0.261	0.050
	(0.044)	(0.044)	(0.097)	(0.088)	(0.215)	(0.041)
factor(birthorder)2	0.081^{*}	0.081^{*}	-0.084	-0.145	0.396^{*}	0.076^{*}
	(0.044)	(0.044)	(0.090)	(0.088)	(0.214)	(0.040)
factor(birthorder)3	0.077^{*}	0.077^{*}	-0.069	-0.144	0.374^{*}	0.071^{*}
	(0.044)	(0.044)	(0.083)	(0.088)	(0.213)	(0.039)
factor(birthorder)4	0.068	0.068	-0.059	-0.142	0.328	0.062
	(0.044)	(0.044)	(0.075)	(0.088)	(0.212)	(0.039)
factor(birthorder)5	0.067	0.067	-0.040	-0.143	0.323	0.061
	(0.044)	(0.044)	(0.068)	(0.088)	(0.212)	(0.039)
factor(birthorder)6	0.059	0.059	-0.029	-0.145^{*}	0.280	0.053
	(0.044)	(0.044)	(0.061)	(0.088)	(0.211)	(0.039)
factor(birthorder)7	0.044	0.044	-0.024	-0.115	0.212	0.040
	(0.044)	(0.044)	(0.055)	(0.088)	(0.212)	(0.040)
factor(birthorder)8	0.036	0.036	-0.014	-0.116	0.171	0.033
	(0.043)	(0.043)	(0.050)	(0.085)	(0.210)	(0.040)
factor(birthorder)9	0.068	0.067	0.039	-0.083	0.325	0.061^{*}
	(0.042)	(0.042)	(0.045)	(0.080)	(0.204)	(0.037)
motheragefirstchild	0.001^{***}	0.001^{***}	0.000	0.001^{**}	0.006^{***}	0.001^{***}
	(0.000)	(0.000)	(0.001)	(0.000)	(0.002)	(0.000)
spousagegap	-0.000	-0.000	-0.000	-0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)
fatherliterateTRUE	0.060^{***}	0.060^{***}	0.060^{***}	0.153^{***}	0.296^{***}	0.060^{***}
	(0.007)	(0.007)	(0.007)	(0.008)	(0.033)	(0.007)
motherliterateTRUE	0.082^{***}	0.082^{***}	0.079^{***}	0.232^{***}	0.391^{***}	0.080^{***}
	(0.007)	(0.007)	(0.007)	(0.008)	(0.033)	(0.007)
log1p(fatherincome)	0.026^{***}	0.026^{***}	0.025^{***}	0.013^{***}	0.129^{***}	0.025^{***}
	(0.004)	(0.004)	(0.004)	(0.002)	(0.018)	(0.003)
log1p(motherincome)	-0.008^{***}	-0.008^{***}	-0.011^{***}	-0.017^{***}	-0.053^{***}	-0.010^{***}
	(0.003)	(0.003)	(0.003)	(0.004)	(0.017)	(0.003)
nsis		0.005^{***}				
		(0.001)				
nbro		0.005^{***}				
		(0.001)				
R^2	0.198	0.198	0.194	0.404		
Adj. R^2	0.197	0.197	0.193	0.404		
Num. obs.	134191	134191	134191	69801	134191	134191
RMSE	0.441	0.441	0.443	0.283		
AIC					154269.706	154269.706
BIC					155015.040	155015.040
Log Likelihood					-77058.853	-77058.853
Deviance					154117.706	154117.706

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Regional and race controls included.

Table 21: napp usa 1880b, enrolment

	OLS	OLS	IV	Logit	Mfx
(Intercept)	0.077	0.077	0.074	-3.083	-0.100
	(0.103)	(0.103)	(0.186)	(2.643)	(0.096)
nsib	-0.008		-0.008	-0.246	-0.008
	(0.008)		(0.022)	(0.227)	(0.008)
age	0.008^{*}	0.008^{*}	0.008^{*}	0.208	0.007
	(0.004)	(0.004)	(0.004)	(0.148)	(0.006)
maleTRUE	0.021	0.021	0.021	0.627	0.020
	(0.017)	(0.017)	(0.017)	(0.553)	(0.016)
nserv	0.016	0.016	0.016	0.322	0.010
	(0.011)	(0.011)	(0.011)	(0.285)	(0.010)
factor(birthorder)1	-0.037	-0.037	-0.035	-0.534	-0.017
	(0.046)	(0.047)	(0.089)	(1.196)	(0.038)
factor(birthorder)2	-0.019	-0.019	-0.017	0.112	0.004
	(0.042)	(0.042)	(0.076)	(0.943)	(0.031)
factor(birthorder)3	-0.043	-0.044	-0.043	-0.921	-0.024
	(0.036)	(0.035)	(0.057)	(1.031)	(0.020)
factor(birthorder)4	-0.067	-0.067	-0.066	-18.038^{***}	-0.046^{***}
	(0.044)	(0.044)	(0.051)	(1.436)	(0.009)
nextd	0.058	0.058	0.058	0.932^{**}	0.030^{*}
	(0.040)	(0.040)	(0.041)	(0.462)	(0.018)
motheragefirstchild	-0.004^{*}	-0.004^{*}	-0.004	-0.116	-0.004
	(0.002)	(0.002)	(0.003)	(0.072)	(0.002)
spousagegap	-0.001	-0.001	-0.001	-0.014	-0.000
	(0.001)	(0.001)	(0.002)	(0.036)	(0.001)
fatherreligionprotestant	0.014	0.014	0.014	0.486	0.014
	(0.029)	(0.029)	(0.032)	(0.949)	(0.025)
nbro		-0.008			
		(0.010)			
nsis		-0.009			
		(0.009)			
R^2	0.130	0.130	0.130		
Adj. R^2	0.070	0.068	0.070		
Num. obs.	595	595	595	595	595
RMSE	0.194	0.194	0.194		
AIC				219.932	219.932
BIC				391.086	391.086
Log Likelihood				-70.966	-70.966
Deviance				141.932	141.932

$^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Standard errors clustered at household-level. Occup. and region controls included

Table 22: mos zurich 1870, enrolment