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# Family scholarly culture and educational success: Books and schooling in 27 nations

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**Abstract**

Children growing up in homes with many books get 3 years more schooling than children from bookless homes, independent of their parents' education, occupation, and class. This is as great an advantage as having university educated rather than unschooled parents, and twice the advantage of having a professional rather than an unskilled father. It holds equally in rich nations and in poor; in the past and in the present; under Communism, capitalism, and Apartheid; and most strongly in China. Data are from representative national samples in 27 nations, with over 70,000 cases, analyzed using multi-level linear and probit models with multiple imputation of missing data.


*Keywords:* Social stratification; Education; Books; Scholarly culture; Elite closure; Cultural capital; Home literacy environment; Culture; Schooling; Cross-national

Throughout the world, education is the key to good jobs and high incomes, and hence a central concern in sociology. Research in the Blau-Duncan tradition long ago delineated, with considerable precision, how parents' education, occupational status, and class shape their offspring's educational careers and how this does (or does not) vary between nations, over time, and in response to government policy. Researchers have now begun to explore a wide range of other parental resources. Promising among them is scholarly culture – the way of life in homes where books are numerous, esteemed, read, and enjoyed. Recent research on several Western nations, as well as Hungary, suggests that parents' scholarly culture enhances children's educational attainment, net of other things (Crook, 1997a; de Graaf, 1986; de Graaf, de Graaf, & Kraaykamp, 2000; DiMaggio, 1982; Evans & Kelley, 2002; Ganzeboom, de Graaf, & Robert, 1990). The effect is usually "weak but significant" (Aschaffenburg & Maas, 1997), sometimes absent, and varies greatly depending on which aspect of culture is measured (Kingston, 2001). It most likely comes about because children from cultured homes perform better in school (Park, 2008).

We pursue this promising beginning, measuring parents' scholarly culture in a consistent manner by the number of books in the home and estimating its effect on children's education in 27 nations, net of a comprehensive, consistently measured set of control variables. We

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seek to establish whether it has an impact on children's education only in a handful of rich Western nations at the end of the 20th century, or whether it is important in all rich nations, or in all market economies, or under Communism, or only in recent decades rather than in past generations.

It is not yet clear *why* scholarly culture has an impact. If it is an elite conspiracy using essentially arbitrary cultural signals to recognize fellow members and to exclude others (Bourdieu, 1984), it is likely to be important only in a few nations under particular historical circumstances and vulnerable to changes in government policy. But if scholarly culture provides skills and knowledge that are central to literacy and numeracy, and hence valuable in schools everywhere, it is likely to be important throughout the world and little affected by historical circumstance or government policy.

To address these issues, we analyze a broad array of countries at different levels of economic development, in different historical periods, with varying cultural backgrounds, following diverse social and political policies. Multiple, diverse tests make for a stronger theory testing program (Stinchcombe, 1968). Data are from the World Inequality Study, a large database compiled from high quality, representative national samples (27 nations for this analysis; $N = 73{,}349$), analyzed with multi-level linear and probit models with multiple imputation of missing values.

*Plan of the paper*. We first describe our theory. The following sections detail our evidentiary base, define variables, and describe our estimation procedures. A descriptive section then gives basic information for each country. The main analytic section estimates the effect of parents' scholarly culture in the pooled sample, assesses interactions, evaluates historical differences, and gives country-specific details. Sensitivity analyses investigate the robustness of our results. A summary and discussion conclude.

## 1. Theory

Research on the role of culture in status attainment has largely focused on its influence on formal education. Within this research tradition, two broad themes have emerged. On the one hand, a scholarly culture model (e.g. Crook, 1997a; de Graaf, 1986; Evans & Kelley, 2002; Teachman, 1987) views the effects of books and reading on education as a consequence of culture being a "toolkit" of competencies, skills, and funds of knowledge, with complexity an important theme (Kohn, Naoi, Schoenbach, Schooler, & Slomczynski, 1990; Spaeth, 1976; Swidler, 1986). The key proposition is that scholarly culture enhances learning and performance in school. On the other hand, an elite closure model (incisively summarized and critiqued in Kingston, 2001) views the effects of scholarly culture as a consequence of the elite using essentially arbitrary cultural signals to recognize fellow members and to exclude others (Bourdieu, 1984; Goblot, 1925 [1973]). The key proposition here is that elites arbitrarily choose high culture as a signal of elite membership but that it has no substantive impact on task performance.

Nomenclature in this area is varied and confusing. What we call the "elite closure" model focusing on elite discrimination via cultural markers or "secret handshakes" is far removed from the natural interpretation of its alternative name of "cultural capital" which suggests skills and knowledge analogous to "human capital". We describe skills and information useful in school work as "scholarly culture" rather than as "human capital" because the economists' "human capital" usage suggests that that acquiring skills and information is a "cost" to the individual (notably in income forgone), whereas our approach posits it as a normal part of their lifestyle. Reading for pleasure, acting out stories based on favorite books, playing charades or word games on a winter's night – all of these are intrinsically rewarding, even if they also enhance skills that are rewarded in school.

The scholarly culture and elite closure perspectives make largely similar predictions about the effects of scholarly culture in rich Western democracies with stable elites. But they have different implications for poor people, past times, and Communist governments. If bookish origins provide cognitive toolkits that enhance task performance, as the scholarly culture theory claims, they are likely to be valued under diverse regimes and valued by modest families, not just the elite. For example, there is no reason why Communist educational systems should value competence less than educational systems in market societies. But if the scholarly culture merely provides arbitrary signals, "secret handshakes" that allow elites to monopolize advantages, then it seems extremely unlikely that societies differing in regime orientation – from Communist to fascist, from those intent on exploding privilege to those aggressively entrenching it – and that differ in culture, in wealth, and in many other ways should just coincidentally settle on the same signal. Thus, the broad array of countries and time periods analyzed in this paper provides new insights into these theoretical issues.

Because, as will be seen, the results support the scholarly culture model, we focus on that here and return to the implications for alternative theories in the Discussion.

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## 2. Scholarly culture

### 2.1. Cultural toolkit

Stemming from work by Spaeth (1976) and de Graaf (1986), the scholarly culture hypothesis holds that reading provides cognitive skills that enhance educational attainment, a cultural toolkit. A home in which books are an integral part of the way of life will encourage children to read for pleasure, thereby providing them with information, vocabulary, imaginative richness, and wide horizons (Dronkers, 1992).

The usage of the term "culture" here refers not to overarching values, but rather to culture as an everyday, routine set of practices and preferences that are engaged with material objects (books, in this case) and with activities (reading, talking about books, using knowledge). This has also been called "mini-culture" (Evans & Lukic, 1998) or "habitus" (Bourdieu, 1984).[1] The argument is that it generates generalized cognitive skills [or "complexity" (Kohn et al., 1997), or a "toolkit" (Swidler, 1986)] which are useful in problem solving in formal education, even on topics distant from the books' subject matter.[2]

This approach suggests that a substantive connection between scholarly resources and performance in school accounts for much of culture's effect on educational attainment (Bidwell, 1989; Teachman, 1987). Books and reading are a concrete resource and indicate a cognitively complex way of life that enhances intellectual capacities in ways directly useful in school, improving academic performance. For example, the larger the home library, the better children perform on standardized reading tests, net of parents' education, across a broad range of countries (Park, 2008).

Because it generates skills and knowledge central to schooling, scholarly culture should enhance educational achievement in all societies, rich and poor alike; in all political systems, Communist and capitalist alike; and in the past as well as the present.

### 2.2. Diminishing marginal returns

The scholarly culture approach suggests diminishing marginal returns to cognitive resources. The reason for this is that culture is *not* analogous to material capital in one crucial respect. Material capital is *exclusive*: only one person can own it at a time, it is a zero sum resource. In contrast, culture is *shared*: many people can possess it at the same time. As a consequence, the gain from a gift of culture depends on what culture the recipient had to begin with. For example, suppose that my uncle the archaeologist gives me a chance to work in his dig one summer. If I were previously ignorant of archaeology, I would learn a vast amount: new words, new skills, and new knowledge. But if I had been there the summer before, or if I already had a PhD in archaeology, I would learn much less, since I would already know much of what is on offer. So a gift of culture has diminishing marginal returns.

Parents' home library, and the vocabulary, skills, and knowledge that come from it, are shared resources. More formally, let $Book_1$ be the set of all words, ideas, information, and skills to be acquired from the 1st book in the home library; $Book_2$ those for the 2nd book; and so on to $Book_N$. Then the set of all words, ideas, etc. in the parents' home library, *pBooks*, is the union of $Book_1$ to $Book_N$:

$$pBooks = Book_1 \cup Book_2 \cup \cdots \cup Book_N \quad (1)$$

Because working vocabularies are somewhat limited, because the information base of any particular book is limited, and because key interpretive strategies are mastered relatively early (with more sophisticated ones being variations on established themes), the existing "stocks" of information, vocabulary, etc., will in general grow with library size. But each new book contributes progressively less new material, adds less to the "stocks" than did the books acquired earlier, since much is redundant. For example, the first reading of *Green Eggs and Ham*, opens up a whole new world; and, after that, most of the words in *Fox in Socks* would be still be new; but by the time one has mastered *Hamlet*, the vocab-

[1] An alternative term, used particularly in the analysis of early childhood cognitive performance, is "home literacy environment" (e.g. Farkas & Hibel, 2008). This is also a clear term, but we prefer the culture terminology because it is used in this sense in the literature on which we draw most closely and because it makes explicit the links to larger theoretical issues which are important here.

[2] It is logically possible that books could be separated from such a culture – perhaps being inherited from a maiden aunt – and that they are so intrinsically attractive that children devour them voraciously in the absence of any support or encouragement from parents. But it is not likely: In Australia (where we have information both on home library size and on reading, unlike the international data), of parents with 100 or more books, only 2% never read, and on average, their children noticed them reading more than once a week. The correlation between owning books and reading is fully 0.64. Consider also the dust that gathers on school library shelves unless children are assigned to work there: Availability is not enough. So interpreting a home library as an indicator of participation in a scholarly culture/subculture is reasonable. Indeed, close study of reading, books, and related matters in the homes of young children shows that the number of books in the home is "...one of the more accurate measures of parental interest in providing instruction to the child" (Farkas & Hibel, 2008).

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ulary and interpretive strategies required for *Macbeth* are only a slight advance. Thus the relationship between the number of books in the home and the scholarly culture/cultural toolkit gained from them will be non-linear, showing diminishing marginal increments for each additional book.

### 2.3. Interactions

Now consider what gains to their cognitive toolkits children get out of their parents' books (*pBooks*), their parents' education (*pEduc*), and so on. If $V_t$ is the set of vocabulary, ideas, information, etc., that a child possesses at time $t$ (for example, when they are 8 years old), then their stock of scholarly culture at the end of the following year is the union of (1) what they already had and (2) what they are exposed to that year from their parents' home library (for example, 3% of the total), less what of that they already knew ($pBooks \cap V_t$); and (3) plus what they are exposed to because of their parents' education, less what of that they already knew ($pEduc \cap V_t$), and so on:

$$\begin{aligned} V_{t+1} = V_t &\cup b_1(pBooks - (pBooks \cap V_t)) \\ &\cup b_2(pEduc - (pEduc \cap V_t)) \\ &\cup \ldots \text{etc.} \end{aligned} \tag{2}$$

where $b_i(\,)$ is a function, analogous to a regression coefficient, which chooses a certain proportion of the members of a set. The same logic applies whether it is the respondent or any other family members reading the books: they will bring their enhanced scholarly culture into their normal interactions with the rest of the family.

The model of Eq. (2) implies a negative interaction between number of books in the parents' home library, *pBooks*, and parents' education, *pEduc* – the more one already has from one source and so the greater $V_t$, the less any increment from the other can contribute. Thus children from poorly educated families will benefit proportionately more from scholarly culture than will children from well-educated families.

### 2.4. Cultural preferences

In addition to providing skills and knowledge, a large home library is a manifestation of the family's preferences: an indication that they enjoy and value scholarly culture, that they find ideas congenial, reading agreeable, complex and intellectually demanding work attractive. It shows a commitment to investing in knowledge, and perhaps in schooling. It suggests that conversations between parents and their children will include references to books and imaginative ideas growing out of them. In short, a large library reveals a preference for the scholarly culture.

Moreover, a home library is a relatively pure measure of preference. It is little contaminated by financial constraints – books are not expensive, unlike educational credentials which cost orders of magnitude more in income forgone and tuition paid. Nor are there financial attractions; one reads a book at home for pleasure, but one goes to college in part for the income and security it ensures afterward in the labor market. Nor are there many practical constraints: love, war, and wanderlust may upset well-laid educational plans, but books are to be had anywhere and anytime.

Our argument thus suggests:

**H1.** Scholarly culture confers educational advantage: parents' participation in scholarly culture will enhance children's educational attainment, net of the parents' formal education and social class, and do so in all nations, throughout history, and regardless of government policy.

**H2.** Biggest gains at the bottom: an increase in scholarly culture has the greatest impact on children from families with little scholarly culture.[3]

**H3.** Interaction with formal education: scholarly culture has a greater effect on children's education if their parents are poorly educated.[4]

Other approaches offer counter-arguments to all these hypotheses; we take them up in the Discussion, where we reflect on them in light of the evidence.

## 3. Data

The World Inequality Study (Kelley, Evans, & Sikora, 2007) pools data from several major projects, all based on representative national samples incorporating detailed information on father's and respondent's occupation (4-digit ISCO or equivalent) and detailed educational data. They are: the International Social Survey Program ISSP (Zentralarchiv fuer Empirische Sozialforschung, 2002); the Social Stratification in Eastern Europe SSEE, surveys (Szelenyi & Treiman, 1994); the Life Histories and Social Change in Contemporary China Survey (Treiman

[3] For example, going from 10 books to 20 will matter more than going from 40 to 50.

[4] For example, going from 10 books to 20 in a family where both parents only finished primary school will help more than going from 10 to 20 books in a family where both parents finished high school.

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et al., 1996); the International Survey of Economic Attitudes (Kelley et al., 1998); and the Social Change in South Africa survey (Treiman & Lewin, 1993). We analyze only surveys which include a question on home library size.[5] With this restriction, there are 73,249 cases with valid answers in 27 nations ranging from poor countries (Philippines, China) to the rich countries of Northwestern Europe and its overseas extensions. Because education typically occurs early in the life cycle, and because these surveys have retrospective data about family background, they provide temporal depth reaching back to World War II for older cohorts. Into these individual level data we have merged contextual level data on economic development (GDP when respondent was 15 and beginning to make school/career decisions) and political-institutional context (Communist vs. non-Communist).

In the country-by-country analyses, we provide race-specific estimates for South Africa, because the pattern of effects is particularly telling for our theory and because educational segregation was extreme. We also provide analyses for China as a whole and for the urban and rural sectors separately, because residential controls and differentiation of privilege between the cities and the countryside (Unger, 1982) could well lead to different links between scholarly culture and education. Internal differentiation in other nations is less institutionalized. East Germany is treated as a separate nation as most respondents were educated under the former Communist regime, in very different circumstances from West Germany.

### 3.1. Imputation of missing data

In order to use all the information that respondents provide, we did multiple imputation of missing data separately for each society, following the general approach of King and colleagues (Honaker, Joseph, King, Scheve, & Singh, 2003; King, Honaker, Joseph, & Scheve, 2001), in practice a regression-based technique augmented by a random component to the imputed value. We did the imputations, under the assumption that the data are missing at random (MAR), separately for each country to take advantage of country-specific patterns. These and related procedures have desirable properties when data are "missing completely at random" (MCAR) or, as is reasonable to assume here, "missing at random" (MAR); they also perform well in simulations (Allison, 2000; Schafer, 1997). Given our many samples, King et al.'s attractive software was impractical, so we used IVEware, from the Survey Research Center at the University of Michigan (Raghunathan, Solenberger, & Van Hoewyk, 2004),[6] choosing options to estimate models similar to King's.

## 4. Measurement

### 4.1. Scholarly culture: number of books in the parents' home

To measure parents' scholarly culture, the surveys asked the number of books in the parents' home when the respondent was young.[7] The question usually followed items on parents' education and occupation:

About how many books were there around your family's house when you were 14 years old?
- None
- 1 or 2
- Around 10
- Around 20
- Around 50
- Around 100
- Around 200
- Around 500
- 1000 or more

This item has good measurement properties. First, it is reported reliably. Test–retest reliability over a 5-year period is $r = .76$ in Australia, compared to .75 for parents' education, .81 for father's occupational status, .60 for father's ownership, and .58 for father supervisor ($N = 1150$; calculations by the authors).

Second, the item also appears to be a valid indicator of scholarly culture in the home. Following pioneering work in the Netherlands (de Graaf, 1986), research in several nations shows that parents' books (home library size) is correlated with other aspects of scholarly culture, including how often parents read "serious novels or poetry"; read science, mathematics or technology; read

[5] Australia: International Social Science Survey/Australia, 1984–2003 Kelley et al; Bulgaria 1993 SSEE; Canada 1999 ISSP; Chile 1999 ISSP; China 1996 Treiman et al; Cyprus 1999 ISSP; Czech Republic 1993 SSEE and 1999 ISSP; France 1999 ISSP; Germany East 1999 ISSP; Germany West 1999 ISSP; Hungary 1993 SSEE and 1999 ISSP; Israel 1999 ISSP; Japan 1999 ISSP; Latvia 1999 ISSP; Netherlands 1999 ISSP; New Zealand 1999 ISSP; Norway 1999 ISSP; Philippines 1999 ISSP; Poland 1993/4 SSEE and 1999 ISSP; Portugal 1999 ISSP; Russia 1993 SSEE and 1999 ISSP; Slovakia 1993 SSEE and 1999 ISSP; Slovenia 1999 ISSP; South Africa 1992 Treiman et al.; Spain 1999 ISSP; Sweden 1999 ISSP; USA 1999 GSS/ISSP.

[6] On the advantages of this method see Downey, Hippel, and Broh (2004).

[7] The time reference was usually age 14; in some nations it was age 15 or 16 according to local conventions.

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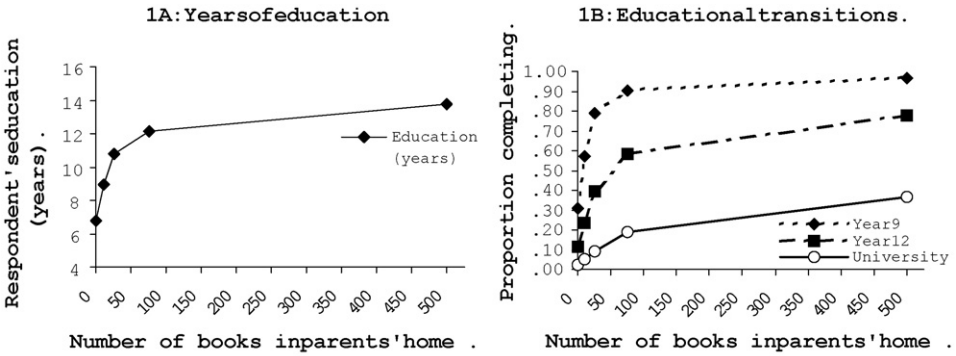


Fig. 1. Description: books in parents' home and children's education. Means, unadjusted. Pooled data from 31 nations; $N = 72{,}787$. *Source*: Table A.2.

"other serious books like history or biography"; and went to the library; and, moreover, that it is clearly distinct from arts spectatorship involving attendance at drama, art museums, classical, music and dance performances (Crook, 1997b; de Graaf et al., 2000; Evans & Kelley, 2002; Sullivan, 2001; Zimdars, Sullivan, & Heath 2009). Moreover, analysis of many different aspects of the home environment finds that home library size has strong predictive validity as an indicator of parents' attraction to the teaching role vis a vis their children (Farkas & Hibel, 2008).

Thus, this single measure is conceptually central, well correlated with other aspects of scholarly culture, reliably reported by respondents decades after they left their parents' home, and applies to a wide variety of cultures, not just rich Western societies.

We analyze the natural log of this, because both theory and our results suggest diminishing marginal effects (see Fig. 1, below). Characteristically, when there is a non-linear relationship between two variables such that a one-unit change at low values of the independent variable produces relatively large gains in the dependent variable, but these gains shrink at higher values of the independent variable, a natural log transformation of the independent variable linearizes the relationship for estimation purposes (Allen, 1997; Allison, 1999). A familiar example would be the effect of income on happiness – big gains in happiness with each extra dollar when incomes are small, smaller gains in happiness with each extra dollar as incomes get large. Many dose–response models are also linear in the log of the focal independent variable. We also assessed three alternatives: (1) a linear plus quadratic form was inferior to the log specification, (2) a linear plus square root form was inferior to the log specification, and (3) using a set of 7 dummy variables added nothing of consequence. Accordingly, we used the more powerful and parsimonious log specification.

### 4.2. Education

Education was measured by questions appropriate to each nation and then recoded by the original investigators into equivalent years of formal education (Jagodzinski & Uher, 2001; Kelley et al., 1998; Treiman, 1994; Treiman et al., 1993, 1996). Additional, country-specific information on degrees and other qualifications is available for some nations; using this we have sometimes readjusted the original investigators' scores to be more internationally comparable. Country-by-country details are available on www.international-survey.org.

We allow for the possibility that the effects of scholarly culture and family background may differ by level of education by analyzing several key stages: year 9, secondary school, and university. We estimate total effects, contrasting those who completed year 9 or higher with everyone else; contrasting those who finished secondary school or higher with everyone else; and contrasting university graduates with everyone else. This allows for discontinuities without entailing selectivity bias problems that arise from analyzing transitions sequentially (Cameron & Heckman, 1998).

### 4.3. Measurement of class, national context, and other variables

Since the number of books is likely to be correlated with other important determinants of education, we introduce them as controls. These include parents' education and class, and an indicator for Eastern Europe, which has unusually high levels of education for its modest level of economic development.[8]

[8] Expert opinions are divided over the estimation of GDP in Eastern Europe during Communist times (Lancieri, 1993). This issue is beyond

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#### 4.3.1. Economic development when respondent was young

We also include a measure of the nation's GDP per capita when respondent was age 15. Much research on children's performance on achievement tests has included the level of economic development as a predictor variable (e.g. Heyneman & Loxley, 1982; Park, 2008), but, to our knowledge, this is the first analysis to include it in a model of the effects of scholarly culture and parental education on educational attainment. For that we need economic development at the time the schooling took place – for example around 1935 for respondents born in 1920, or around 1995 for respondents born in 1980. Historical estimates of this sort are not readily available. We have developed rough but plausible estimates for them. They are available for download on our website www.international-survey.org.

Table A.1 details the measurement of these variables.

## 5. Methods

### 5.1. Model

We assume that children's education is a function of parents' scholarly culture, family background, and national characteristics:

$$\begin{aligned} Education &= b_1 + b_2 \ln ParentsBooks + b_3 ParentsEducation \\ &+ b_4 FathersOccupation + b_5 FatherOwner \\ &+ b_6 FatherPetitBourgeois + b_7 FatherSupervisor \\ &+ b_8 Male + b_9 LnParentBooks \\ &\times ParentsEducation + b_{10} EasternEurope \\ &+ b_{11} \ln GDP15 + e \end{aligned} \quad (3)$$

For country-by-country analyses the national level variables (Eastern Europe and ln GDP15 drop out). We make no assumption about causal order among variables on the right-hand side.

Our estimates give the direct effects of the right-hand side variables, regardless of how they came about. The intervening mechanisms are interesting but beyond the scope of this analysis.

the scope of this paper, so we have simply used what we believe to be the best available estimates.

### 5.2. Estimation

We use multi-level linear and probit regression to estimate our core models. For the country-specific analyses, we use OLS (with robust Huber-White standard errors) and probit models.

### 5.3. Presentation of results: first differences

The crucial issue is how much schooling is implied for students from families with different numbers of books in the home. For models that are fully linear this is a well-known matter of applying appropriate means to the regression parameters and taking differences in predicted values (Jones & Kelley, 1984). But it is not so simple for our curvilinear dependent variable, the natural log of books, or for the intrinsically non-linear probit estimates. We therefore present first differences in predicted values, which are closely related to partial derivatives (King, Murray, Salomon, & Tandon, 2004). We estimate them from a whole population standardization (Kelley & Evans, 1995) which makes comparisons using a common reference population, here the pooled set of respondents.[9] The results depend both on the equation and on the population chosen as a baseline for comparison. Specifically, the predicted education of children from bookless homes is obtained by changing every case in the sample to have no books while leaving all other variables unchanged; computing predicted values for every case (using the coefficients in Table A.3); and then averaging. The answer is that they would expect to get 9.4 years of education. Children from otherwise identical families with 500 books would expect to get 12.6 years of education. The difference between these two, an advantage of $12.6 - 9.4 = 3.2$ years, is the key result. Confidence intervals for these differences are computed by bootstrap methods. The effects we discuss throughout the paper are obtained in this way.

We have chosen comparison points reflecting the full range of values, from high (but not extraordinary) to low (but still reasonable). Specifically, for books we compare families with 500 books to those with none (roughly the top 20% vs. the bottom 10% worldwide).[10] For parents' education, we compare college graduates (15 or 16 years of education) to people who left school after 3rd Grade.

[9] Our reference population greatly over-represents Australia because of its large sample. But this makes little practical difference since Australia is unexceptional (see Table 1). For example, the effect of growing up in a family with no books versus one with 500 books is 3.2 years including Australia and 3.3 excluding it entirely.

[10] Scoring the true zeroes as 0.5, so the log is defined.

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Table 1
Description: percentages and means for 31 societies, circa 1999. $N = 73{,}349$[a].

| Society (sorted by mean years of education) | A: Books in parents' home | | | | | | | B: Family background | | | | | | C: Education | | | | Cases[a] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | % None | % Around 10 | % Around 25 | % Around 75 | % Around 500+ | Total = 100% | Mean | Mean, parents' education | Mean, father's occupation | % Father owner | % Father petty bourg | % Father supervise | Mean, GDP at age 15 (Index. 1990 USA = 1) | % Grade 9 or more | % Secondary+ | % University | Mean, years | |
| United States | 3 | 25 | 19 | 34 | 18 | 100 | 112 | 10.9 | 40 | 10 | 12 | 37 | .60 | 95 | 85 | 27 | 13.4 | 1095 |
| Canada | 1 | 17 | 17 | 39 | 25 | 100 | 142 | 11.8 | 45 | 18 | 10 | 37 | .58 | 97 | 84 | 32 | 13.2 | 813 |
| Netherlands | 3 | 16 | 20 | 47 | 14 | 100 | 134 | 9.8 | 44 | 11 | 8 | 29 | .46 | 92 | 61 | 23 | 12.9 | 1422 |
| New Zealand | 2 | 14 | 13 | 43 | 28 | 100 | 164 | 10.0 | 41 | 24 | 12 | 36 | .46 | 91 | 56 | 29 | 12.9 | 957 |
| Israel | 4 | 9 | 11 | 41 | 35 | 100 | 224 | 9.8 | 42 | 16 | 18 | 30 | .33 | 88 | 75 | 23 | 12.8 | 942 |
| France | 3 | 18 | 16 | 40 | 23 | 100 | 143 | 8.1 | 44 | 17 | 16 | 33 | .39 | 91 | 60 | 32 | 12.6 | 1774 |
| Latvia[b] | 2 | 5 | 11 | 37 | 45 | 100 | 265 | 9.7 | 37 | 3 | 9 | 24 | .21 | 91 | 61 | 17 | 12.5 | 950 |
| Norway | 1 | 10 | 16 | 44 | 28 | 100 | 158 | 8.7 | 44 | 4 | 8 | 32 | .45 | 91 | 57 | 20 | 12.4 | 1058 |
| South Africa: White | 2 | 20 | 14 | 39 | 26 | 100 | 152 | 10.6 | 45 | 27 | 4 | 45 | .20 | 95 | 68 | 17 | 12.3 | 2110 |
| Japan | 6 | 22 | 18 | 39 | 15 | 100 | 94 | 7.7 | 39 | 20 | 38 | 31 | .34 | 91 | 74 | 18 | 12.3 | 1102 |
| Czech Republic | 3 | 11 | 12 | 41 | 33 | 100 | 187 | 9.6 | 35 | 3 | 6 | 17 | .21 | 91 | 63 | 15 | 12.3 | 6848 |
| Russia | 16 | 18 | 13 | 30 | 23 | 100 | 146 | 7.1 | 34 | 1 | 3 | 21 | .17 | 81 | 57 | 26 | 12.0 | 5554 |
| Slovakia | 6 | 24 | 19 | 36 | 15 | 100 | 88 | 8.7 | 32 | 2 | 9 | 16 | .19 | 86 | 61 | 13 | 12.0 | 5275 |
| Sweden | 1 | 13 | 15 | 42 | 29 | 100 | 166 | 8.1 | 39 | 20 | 10 | 33 | .47 | 80 | 49 | 14 | 11.4 | 953 |
| Australia | 3 | 18 | 17 | 42 | 21 | 100 | 129 | 8.9 | 40 | 16 | 11 | 38 | .42 | 82 | 40 | 20 | 11.1 | 14,843 |
| Cyprus | 9 | 34 | 21 | 31 | 6 | 100 | 46 | 7.1 | 31 | 12 | 29 | 12 | .22 | 78 | 67 | 20 | 11.0 | 874 |
| Slovenia | 11 | 27 | 19 | 33 | 10 | 100 | 69 | 7.5 | 28 | 4 | 21 | 20 | .25 | 70 | 44 | 11 | 10.9 | 891 |
| Germany-East | 8 | 16 | 20 | 38 | 19 | 100 | 111 | 7.1 | 34 | 7 | 5 | 27 | .24 | 65 | 17 | 12 | 10.9 | 455 |
| Poland | 18 | 26 | 18 | 28 | 10 | 100 | 68 | 7.5 | 27 | 4 | 35 | 13 | .16 | 72 | 39 | 10 | 10.8 | 4088 |
| Philippines | 15 | 54 | 16 | 12 | 2 | 100 | 22 | 7.3 | 25 | 10 | 48 | 19 | .09 | 62 | 31 | 17 | 10.8 | 966 |
| Hungary | 16 | 23 | 15 | 27 | 20 | 100 | 117 | 7.0 | 28 | 4 | 20 | 11 | .15 | 63 | 38 | 12 | 10.6 | 5418 |
| Bulgaria | 30 | 25 | 12 | 21 | 12 | 100 | 81 | 5.8 | 26 | 2 | 17 | 8 | .13 | 66 | 35 | 12 | 10.5 | 4221 |
| Germany-West | 7 | 22 | 20 | 35 | 16 | 100 | 96 | 7.0 | 37 | 13 | 9 | 27 | .38 | 46 | 16 | 9 | 10.1 | 822 |
| Spain | 12 | 31 | 20 | 27 | 10 | 100 | 61 | 5.5 | 27 | 5 | 28 | 11 | .30 | 57 | 33 | 15 | 9.8 | 1013 |
| South Africa: Asian | 4 | 46 | 22 | 23 | 6 | 100 | 42 | 4.2 | 32 | 17 | 14 | 23 | .21 | 59 | 25 | 5 | 9.3 | 658 |
| Chile | 14 | 48 | 15 | 19 | 4 | 100 | 30 | 5.5 | 26 | 9 | 26 | 17 | .15 | 54 | 39 | 10 | 9.3 | 1190 |
| China: Urban born | 9 | 31 | 25 | 32 | 3 | 100 | 66 | 3.7 | 32 | 7 | 6 | 18 | .03 | 76 | 26 | 4 | 9.0 | 1814 |
| South Africa: Colored | 16 | 39 | 15 | 21 | 8 | 100 | 53 | 5.6 | 25 | 7 | 5 | 17 | .21 | 48 | 17 | 3 | 8.3 | 707 |
| South Africa: Black | 31 | 40 | 10 | 13 | 7 | 100 | 48 | 3.7 | 23 | 6 | 6 | 12 | .22 | 36 | 14 | 1 | 6.8 | 3517 |
| Portugal | 17 | 47 | 12 | 17 | 8 | 100 | 52 | 3.3 | 27 | 10 | 28 | 15 | .20 | 26 | 15 | 6 | 6.4 | 1019 |
| China: Rural born | 25 | 44 | 19 | 12 | 0 | 100 | 25 | 1.6 | 9 | 3 | 12 | 4 | .03 | 41 | 10 | 1 | 5.9 | 3738 |
| (Total) | 10 | 23 | 16 | 33 | 18 | 100 | 112 | 7.5 | 33 | 8.5 | 13 | 22 | .25 | 75 | 45 | 15 | 10.8 | 73,349 |

[a] Number of cases is for respondent's education. Ns for other variables vary slightly due to missing data. GDP figures for China and South Africa refer to the whole nation, not the subgroups shown.

[b] The question on books in the home was asked in a slightly non-standard way, which probably leads to an upward bias.

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For father's occupation, we compare free professionals at the top of the occupational hierarchy (ISCO major group 1, prestige 58 and over) to farm laborers at the bottom. For GDP, we compare US levels, at the top, with Chinese levels, near the bottom with GDP per capita around 10% of the US. Other variables are dichotomous, so we compare those with the characteristic to those lacking it.

## 6. Description

Pooling all the countries, around 10% of respondents grew up with no books at home (Table 1, Panel A, bottom row). 23% had around 10 books and 16% had about 25; some 33% had around 75 books, and 18% grew up with hundreds of books. The average is 112.

### 6.1. Who has books?

Books are more numerous in rich nations, but mainly because they have more well-educated, high status families. Hardly any Americans grew up without books and 18% had over 500; the average was 112, the same as the worldwide average. But this is around 80 less that would be expected given America's high GNP and well-educated families, so America's reputation for philistinism may not be entirely undeserved. Book ownership in Western Europe varies greatly. People growing up in Eastern Europe under Communism had neither more or fewer books than expected given their GNP and family background. (Details on these analyses are available at www.international-survey.org.)

### 6.2. Parents' books and children's education

Pooling people from all the countries together, children who grew up without books completed around 7 years of education on average (Fig. 1, Panel A, and Table A.2). Those growing up with a couple of dozen books completed 11 years, and offspring of the most bookish parents completed 14 years of education, about the level of an American junior college degree. Thus, on average, 7 years of education separate those who grew up without books in the home from those who grew up with 500 or more, a huge difference. Each additional book is associated with greater gains in educational attainment in families with few books than in families where there are already many books.

The same pattern holds for each educational transition (Fig. 1, Panel B and Table A.2). We will next see whether these bivariate associations persist after adjustment for our control variables.

## 7. Analysis

### 7.1. Years of education

Home library size has a very substantial effect on educational attainment, even adjusting for parents' education, father's occupational status, and other family background characteristics (Table 2). Growing up in a home with 500 books would propel a child 3.2 years further in education, on average, than would growing up in an otherwise similar home with few or no books ($t = 65$, $p < .001$).[11]

This is a large effect both absolutely and in comparison with other influences on education (Fig. 2, Panel A and Table 2). (1) The difference between a bookless home and one with a 500-book library is as great as the difference between having parents who are barely literate (3 years of education) and having university educated parents (15 or 16 years of education).[12] Thus, a home library is as important as parents' education, the most important variable in the standard educational attainment model. (2) Moreover a home library is twice as important as father's occupation: only 1.6 years of education separates children of farm laborers at the bottom of the hierarchy from professionals' children at the top, all else equal. This is just half the 3.2-year home library gap. (3) Even though rich countries have for generations made huge investments in education, the difference between being born into a society as poor as China and a society as rich as the United States amounts to just 2 years of education, net of family background. This is less than two-thirds the gap that separates children reared in bookless homes those born into 500-book homes, all else equal.

### 7.2. Educational transitions

The major effect of books in the home is evident throughout the educational career: in finishing Year 9, finishing secondary school, and going to university (Table 2). (1) A child growing up in a family with 500 books is 33 percentage points more likely to finish *Year 9* than an otherwise identical child from a home with no books. (2) A child from a 500-book family is 36 per-

[11] This is the first difference in predicted years of education at different levels of home library size, with other variables held constant by whole population standardization, as described in Section 5.

[12] It is reasonable that there should be effects of parents' education net of home library size because going further in the educational system contributes both substantive knowledge and also knowledge about how the system works which parents can use to guide and advise their children (Lucas, 2001).

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Table 2
Estimated gain in education from various sources. First differences[a] from multi-level linear and probit regression models with bootstrapped confidence intervals; multiple imputation of missing data separately for each nation. Pooled data from 31 societies. $N = 77{,}758$[a].

| Variable (and comparison) | Years of education (mean) | | Complete year 9+ (percent) | | Complete secondary+ (percent) | | Complete university (percent) | |
|---|---|---|---|---|---|---|---|---|
| | Gain | 95% C.I. | Gain | 95% C.I. | Gain | 95% C.I. | Gain | 95% C.I. |
| Parents' books (log) (500 books vs. 1 book) | 3.2 | 3.1–.3 | 33% | 32–34 | 36% | 35–37 | 19% | 18–20 |
| Parents' education (15 years vs. 3 years) | 3.2 | 3.1–3.3 | 26% | 25–27 | 36% | 35–38 | 16% | 15–17 |
| Father's occupation (higher professional vs. farm laborer) | 1.6 | 1.5–1.7 | 10% | 9–11 | 15% | 14–17 | 12% | 11–14 |
| Father owner (yes vs. no) | 0.1 | 0.0–0.2 | ns | −3 to −1 | 1% | 0–3 | 1% | 0–2 |
| Father petit bourgeois (yes vs. no) | ns | −0.1 to 0.0 | ns | −5 to −3 | ns | −1 to 0 | 2% | 1–3 |
| Father supervisor (yes vs. no) | 0.4 | 0.3–0.4 | 3% | 2–4 | 3% | 2–4 | 3% | 2–4 |
| GDP when young (USA vs. China) | 2.0 | 1.9–2.1 | 16% | 15–17 | 14% | 13–15 | 4% | 3–5 |
| Eastern Europe (yes vs. no) | 1.4 | 1.4–1.5 | 6% | 6–7 | 11% | 11–12 | 1% | 0–2 |
| Male (yes vs. no) | 0.6 | 0.5–0.6 | 5% | 4–5 | 4% | 3–5 | 4% | 3–4 |

*Source*: Calculated from Table A.3. Bootstrap standard errors based on 200 iterations.

[a] For example in row 1, someone born into a family that had only 1 book but was otherwise average in parents' education, father's occupation, GDP, and the rest, would expect to get 9.4 years of education themselves. Another person from an otherwise identical family with 500 books would expect to get 12.6 years of education. The difference between these two, an advantage of 3.2 years due just to having more books in the family, is reported in column 1. The standard error of this estimate, given in column 2, implies that we can expect, with 95% confidence that the true advantage is between 3.1 and 3.3 years. The calculation for percent completing grade 9 or more in school, reported in column 3, is similar: someone from the first family has a 59% chance of finishing year 9, someone from the second a 91% chance, a difference of 33 percentage points, rounded. *ns*: not significantly different from zero at $p < .001$, two-tailed.

centage points more likely to graduate from *high school* than an otherwise similar child without a home library. (3) Finally, a child from a family rich in books is 19 percentage points more likely to complete *university* than a comparable child growing up without a home library. Books are more important than parents' education or any other influence in the usual model (Fig. 2, Panel B).

Thus the largest gains from a home library are below university level, at year 9 and year 12.[13]

### 7.3. Parents' books and parents' education: interactions?

Our theory implies that scholarly culture will have a strong effect at all educational levels, even far below the elite, with the greatest impact on children whose parents are poorly educated (Hypotheses 2 and 3) – hence a (negative) interaction between parents' books and parents' education. Fig. 3 gives the evidence (details in Table A.4).

#### 7.3.1. Unschooled parents

Take as a baseline the 7.6 years of education predicted for a child whose parents had no books and little or no schooling (Fig. 3, Panel A, lower left corner).[14] Parents like this are common in Portugal or China today and were common in past times in many other nations. We assume the family was average in other respects. Had this family owned 25 books instead of none at all, their child could have expected over 2 more years of schooling, and a further 2 years had they owned 500 books (Panel A, lower right corner). The gain for such families amounts in all to 4.3 years of education, comparing bookless homes to book-rich homes, a huge difference.

[13] This difference is statistically significant, as can be seen from the confidence intervals. Note that this refers to percentage point differences, for example 62% from homes rich in books finishing secondary school versus 26% from bookless homes, a difference of 36 percentage points. This is compared to 24% versus 5% finishing university, a difference of "only" 19 percentage points. But proportionally, coming from a home rich in books increases secondary school completion by 62/26 = 2.4 times while it increases university completion more, 24/5 = 4.8 times.

[14] This is higher than their actual education, 5.0 years (Appendix DAppendix Table D), because the predicted value standardizes for father's occupation, GNP, and other background variables) which tend to have very low values for such a child. Thus, part of their low educational attainment reflects influences controlled in our model.

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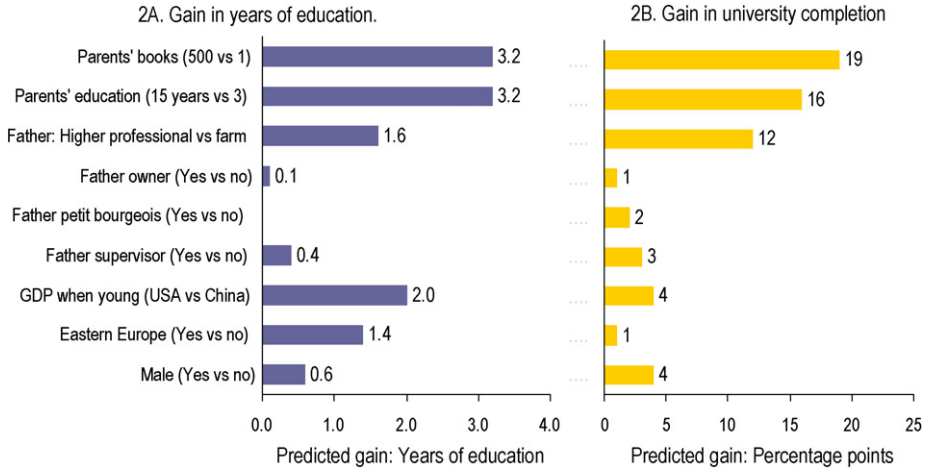


Fig. 2. Estimated gain in education from various sources: first differences from multivariate models in Table 3. $N = 77{,}758$.

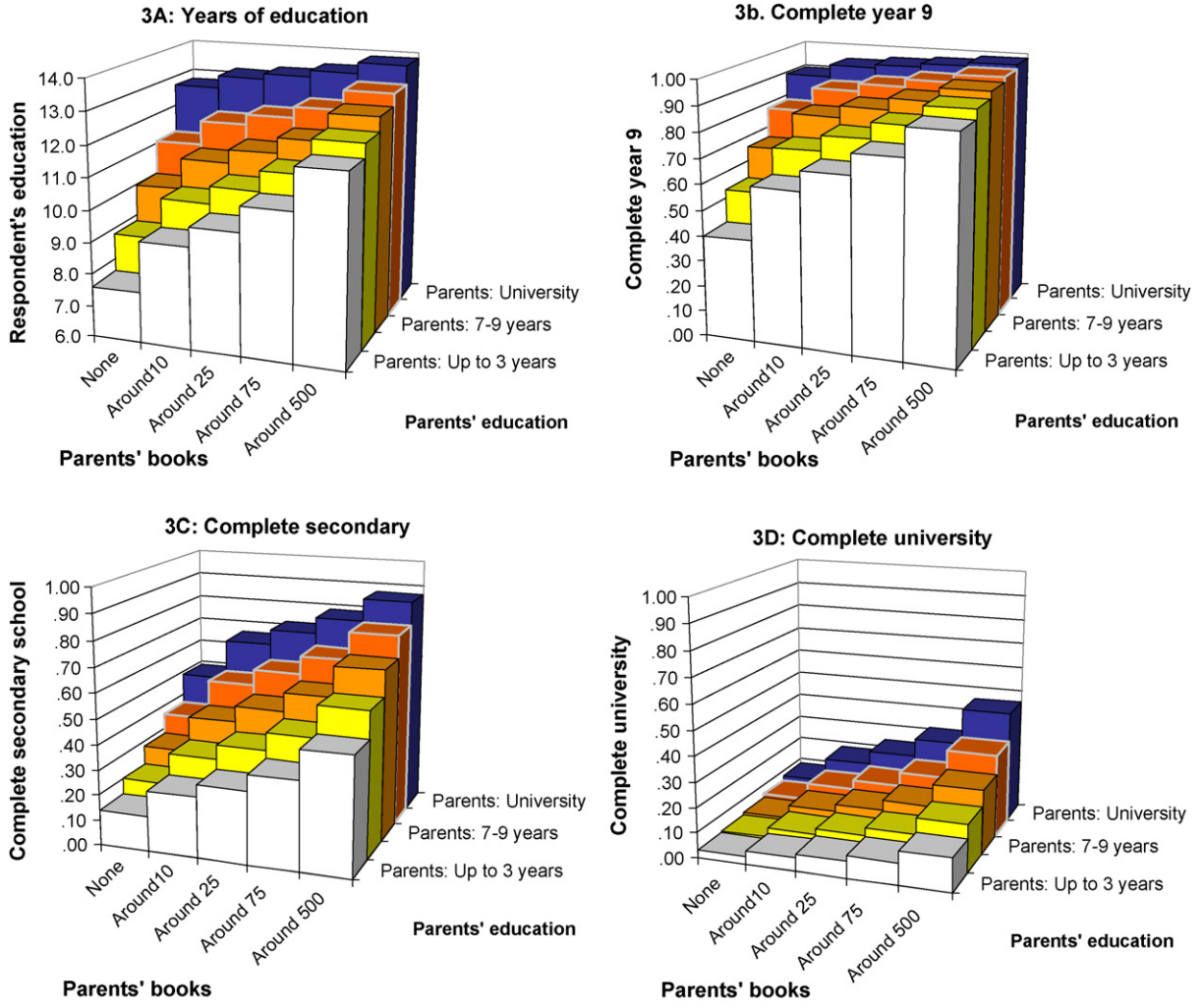


Fig. 3. Estimated education by parents' home library and parents' education, controlling for other aspects of family background and national characteristics. Multi-level linear and probit estimates evaluated by whole population standardization. Pooled data from 31 societies with multiple imputation of missing data; $N = 77{,}758$.
*Source*: Table A.4.

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*7.3.2. Parents with primary schooling*

A child whose parents had no books but had been to primary school and were otherwise average could expect 8.8 years of schooling (Panel A, second row). Had the family instead owned 25 books, the child could have expected almost 2 more years of schooling, and almost a further 2 years with 500 books. The gain amounts in all to 3.5 years. Thus a home library is a great advantage for children whose parents went only to primary school, but not quite as great as for children of uneducated parents.

*7.3.3. Parents with incomplete secondary schooling*

A child whose parents had no books and left school after 8th or 9th Grade (Year 8 or 9) – still common in Western Europe and even more common in the past – could expect 10 years of schooling (Panel A, third row). Had the family instead been rich in books, with 500 in their home library, the child would expect to finish high school and perhaps go a bit beyond, a gain of 2.8 years. Thus a home library is still a big advantage, but not as large as for children from less educated homes.

*7.3.4. Parents with high school education*

A child whose parents had no books, although high school graduates and otherwise average, would not expect to finish high school themselves. Had the parents instead been rich in books, their child could expect to finish high school comfortably and go a year or so beyond. In all, a large home library confers a 2.1-year advantage: large, but not as large as for less educated parents.

*7.3.5. University educated parents*

Finally, a child whose parents (very unusually) had no books despite being university educated, could expect to get 1.1 years less education than a child from a similar home rich in books. This is only a modest advantage, far less than in illiterate homes.

Thus for years of schooling completed, the advantage conferred by a home library is largest for less educated parents and smallest for university educated parents ($t = -26$, $p < .001$; Table A.3). This is as predicted (Hypothesis 3) but contrary to Bourdieu who expected the largest gain for the offspring of the elite.

*7.4. Parents' books and educational transitions: interactions?*

*7.4.1. Year 9*

A home library is a striking advantage in getting through Year 9 in school other things being equal (Fig. 3, Panel B). Only 40% of children from bookless homes with unschooled parents can be expected to finish Year 9, compared to 88% of children with unschooled but book-rich parents, a huge 48 percentage point advantage. The home library advantage is 39 percentage points for children with primary educated parents, 29 percentage points for parents with incomplete secondary, 19 percentage points for high school educated parents, and just 9 percentage points for university educated parents. Thus books matter most when parents have little education ($t = -9$, $p < .001$, Table A.3).

*7.4.2. High school*

A home library is a big advantage in getting children through high school, for illiterate and university educated parents alike (Panel C). For unschooled parents, the advantage of a large home library is 33 percentage points, about the same as the 37 point advantage for primary educated parents, 40 for incomplete secondary parents, 41 for parents with high school education, and 38 for university educated parents. Thus for high school completion, unlike Year 9, books matter more or less equally for all families ($t = 1$, ns).

*7.4.3. University*

For children whose parents are almost illiterate, a home library confers a small but real advantage (Panel D). Only 3% in bookless homes would go to university compared to 13% where there is a large home library, an advantage of 10 percentage points. This advantage rises to 15 percentage points for primary school parents, 21 for parents with incomplete secondary schooling, 28 for high school educated parents, and fully 37 percentage points for university educated parents.

Thus in getting children through university, the advantage conferred by a home library is *largest* for university educated parents and least for poorly educated parents. This is in agreement with the elite closure hypothesis, but contrary to our Hypothesis 3 ($t = 6$, $p < .001$).

*7.5. History and political policy*

Does the great advantage of growing up in cultured homes with many books hold mainly in modern times, among technologically advanced, prosperous, market economies? Or did it also hold in past times and under different political systems? The world of the 1940s was very different; technology was simpler, nations far poorer, and economies ravaged by war. The old world was then transformed by the great post-war boom and the rise of the Welfare State in the West, by Apartheid in South Africa, and by Communism in the East. The period covered by our data saw huge educational upgrad-

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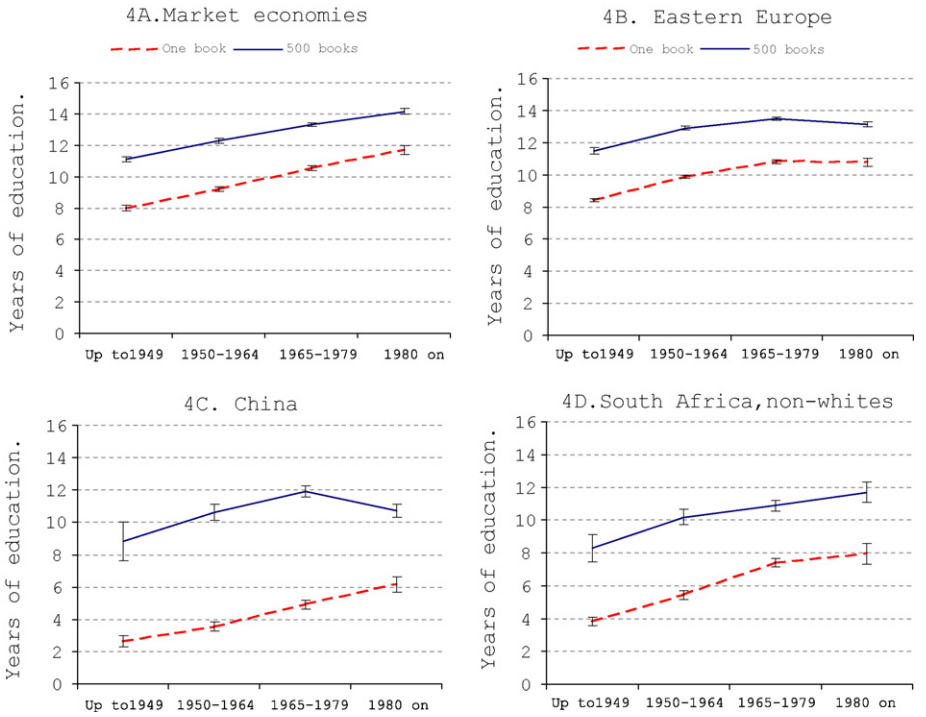


Fig. 4. History: predicted years of education for respondents coming of age in different time periods and in different types of nation. Regression estimates separately for each time period and type of nation. Predicted values control other variables by whole population standardization, using the population of that time period and type of nation as the reference population. 95% confidence intervals. 31 nations; $N = 75{,}648$.
*Source*: Table A.5.

ing throughout the world (Ganzeboom & Treiman, 1993; Treiman & Yip, 1989). How did scholarly culture fare in these very different conditions? Fig. 4 shows that the advantage of books in the home is found throughout the whole range of institutional arrangements covered here, as predicted by Hypothesis 1 (details are in Table A.5).

Scholarly culture's advantage goes back for generations, as far back as the memory of survey respondents can take us, and in all political systems. (1) In the West, the advantage was large before World War II (Panel A). It remained large despite the post-war boom, economic stagnation in the 1970s, and globalization at the end of the century. (2) In Eastern Europe before Communism, scholarly culture was as important as in the West (Panel B). The imposition of Communism was a "natural experiment" changing elites and their orientations and presumably their membership signals, but scholarly culture remained important: the educational result of a generation of Communism was little different than a generation of Western free markets.[15] (3) Being born into a family with many books was a huge advantage in pre-revolutionary China (Panel C). Then the Communists under Mao seized power and later the Cultural Revolution followed – one of history's most extreme, sustained, and bloody attempts to undermine the advantages held by elite families. But the advantage of coming from a family rich in books remained no less than in pre-revolutionary times, indeed far larger than in the West or in Communist Eastern Europe. Only in the most recent period, when market reforms began to spread in China, was there any change and even then the effect remained large.[16] (4) Culture has been a valuable resource for non-white South Africans[17] as far back as the 1940s, with the advantage at least as large as in Western Europe or in Eastern Europe under Communism.

In short, scholarly culture is a great resource for the oppressed, whatever their color, whomever their oppressor, and whatever the historical circumstances.

[15] Many other studies have found this, for example (Ganzeboom & Nieuwbeerta, 1999), although some suggest scholarly culture became somewhat less important toward the end of the Communist period.

[16] For a detailed treatment of trends in literacy and their determinants in China, see Treiman (2006).

[17] Because the analysis is done separately by time period, we need to combine the several non-white groups in order to have sufficient cases.

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Table 3
Influences on respondent's education in each nation separately: estimated gain in education (first differences) from multiple regression controlling family background (Eq. (3)), with multiple imputation of missing data and bootstrapped standard errors. 31 societies, circa 1999. $N = 77{,}758$.

| Nation | Parents' have 500 books vs. 1 book | 95% C.I. | Parents have 15 years education vs. 3 years | 95% C.I. |
|---|---|---|---|---|
| China (all) | 6.6 | 6.2–7.0 | 3.1 | 2.6–3.6 |
| China: Rural born | 6.6 | 6.2–7.0 | 2.8 | 2.2–3.5 |
| China: urban born | 5.5 | 4.7–6.2 | 2.5 | 1.9–3.1 |
| Chile | 5.3 | 4.3–6.3 | 4.2 | 3.3–5.0 |
| Spain | 4.7 | 3.6–5.8 | 6.5 | 5.4–7.7 |
| Norway | 4.3 | 3.4–5.2 | 1.7 | 0.8–2.5 |
| Portugal | 4.1 | 3.3–5.0 | 4.2 | 3.2–5.2 |
| Philippines | 4.0 | 3.0–5.1 | 3.3 | 2.5–4.1 |
| South Africa: Black | 4.0 | 3.6–4.4 | 4.5 | 4.1–4.9 |
| Israel | 3.9 | 3.0–4.8 | 2.5 | 1.7–3.4 |
| South Africa: Asian | 3.8 | 3.0–4.7 | 3.1 | 2.3–3.9 |
| Sweden | 3.6 | 2.5–4.7 | 2.1 | 0.7–3.4 |
| Hungary | 3.5 | 3.2–3.8 | 3.0 | 2.6–3.4 |
| Cyprus | 3.5 | 2.3–4.7 | 3.7 | 2.8–4.5 |
| South Africa (All) | 3.5 | 3.2–3.8 | 4.8 | 4.5–5.0 |
| France | 3.4 | 2.6–4.2 | 2.1 | 1.4–2.8 |
| Poland | 3.3 | 3.0–3.7 | 2.6 | 2.1–3.0 |
| Latvia[a] | 3.3 | 2.4–4.2 | 1.1 | 0.3–1.9 |
| Slovakia | 3.2 | 2.9–3.5 | 2.9 | 2.4–3.3 |
| Germany-West | 2.8 | 2.1–3.6 | 2.7 | 1.2–4.2 |
| New Zealand | 2.8 | 1.9–3.6 | 1.9 | 1.1–2.7 |
| South Africa: Colored | 2.8 | 2.0–3.5 | 3.9 | 3.2–4.7 |
| Czech Republic | 2.7 | 2.5–3.0 | 2.7 | 2.2–3.1 |
| Australia | 2.7 | 2.5–2.9 | 1.9 | 1.7–2.1 |
| Bulgaria | 2.7 | 2.4–3.0 | 3.8 | 2.5–4.2 |
| Slovenia | 2.7 | 1.8–3.5 | 3.0 | 2.0–4.1 |
| Germany-East | 2.6 | 1.5–3.7 | −0.1 | −1.7 to 1.5 |
| Russia | 2.6 | 2.3–2.9 | 2.3 | 2.0–2.6 |
| United States | 2.4 | 1.7–3.1 | 2.3 | 1.6–2.9 |
| Japan | 2.2 | 1.6–2.8 | 2.1 | 1.6–2.6 |
| Netherlands | 2.1 | 1.5–2.7 | 2.8 | 1.9–3.8 |
| South Africa: White | 1.8 | 1.4–2.1 | 2.9 | 2.3–3.4 |
| Canada | 1.6 | 0.7–2.5 | 1.6 | 0.7–2.5 |
| All (mean) | 3.7 | | | 3.0 |

*Source*: Calculated from Table A.6.
[a] For clarity, the interaction between books and parents' education is omitted; it is small in all societies, although statistically significant in many.

### 7.6. Country-by-country results

Growing up in homes with numerous books greatly boosts educational success in every country in our sample (Table 3). For example in the US – where the advantage is relatively modest – a child whose parents have 500 books can expect to get about 2 or 3 years more education than a comparable child from a bookless home. The advantage in Australia and West Germany is similar; not far different in Bourdieu's France; larger in Norway and Spain (4 or 5 years); and largest in China (6 or 7 years).

There is no evidence of a trade-off between books and formal education (Fig. 5). On the contrary, parents' books tend to give a large advantage precisely in countries where parents' education also gives a large advantage ($r = .36$, $t = 2.08$, $p < .05$, calculated with nations as the unit of analysis). Spain, Chile, China, and Portugal stand out as societies where both books and formal education matter a lot, as they do for South African blacks. On average, parents' books matter a bit more than parents' education.

### 7.7. Extensions and sensitivity analyses

#### 7.7.1. Measurement of occupational status

Status attainment models can be sensitive to the way occupational status is measured so we re-estimated our models using the well-known ISEI scores (Ganzeboom & Treiman, 1996, 2003) instead of the Worldwide Status

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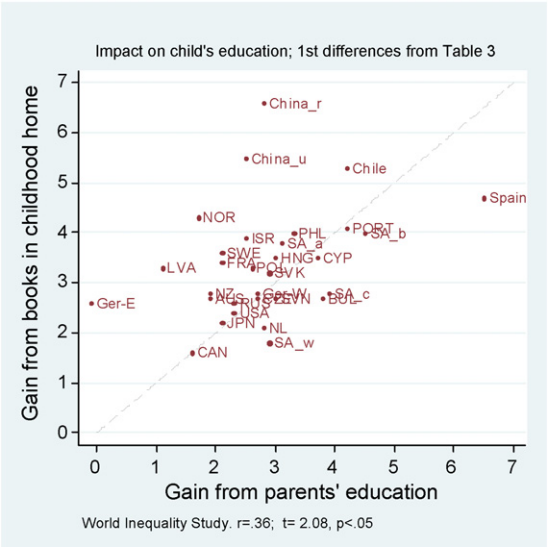


Fig. 5. Effect of books and parents' education. Impact on child's education: 1st differences from Table 3.

scores. But in fact, this makes no discernible difference (Table A.7).

### 7.7.2. *Functional form*

Our model (Eq. (3)) is highly parametric, with strong assumptions (albeit ones well justified by theory and preliminary analyses) about measurement, functional form, and interactions. A useful contrast is provided by "nearest neighbor" methods developed in economics to assess treatment effects with minimal parametric assumptions (Abadie, Drukker, Herr, & Imbens, 2004); these are conceptually similar to "hot deck" methods for imputing missing data. They require dichotomizing the independent variable, a major loss of information for continuous variables like ours. Dichotomizing parents' books near the median, our parametric model implies a difference of 1.14 years of education for those growing up in families above and below the median (with a standard error of .024), other things being equal. Matching on the same variables used in our model, Imbens' nearest neighbor estimate is 1.21 (with a standard error of .034). This is comfortingly close.

*Random measurement error* is serious problem, leading to a variety of biases, as has long been known (Blalock, 1965; Kelley, 1973). For the variables at hand, the only comprehensive set of reliabilities available with which to correct for attenuation are for Australia (Table A.8, column 1). Using standard structural equation methods (Arbuckle & Wothke, 1999), we corrected our key analysis on the assumption that the Australian reliabilities would apply, at least approximately, to the other nations (Table A.3, Panel B). This is not an unproblematic assumption. However, ignoring measurement error is equivalent to assuming that all variables are measured without error, an even more problematic assumption.

Both books and parents' education are reliably measured, with a test–retest correlation of $r = .76$ over a five year period. This compares to .81 for father's occupational status and around .60 for other aspects of class. Corrections for attenuation slightly increase the effect of books (by 7%) and parents' education (by 20%). The (considerable) effect of father's status is reduced to zero. In uncorrected analyses, it seems to have been picking up variance properly attributable to parents' education and perhaps books. The effect of GDP goes down by almost half, probably for the same reason. Other effects, all small to begin with, change modestly in both directions.

Applying the Australian reliabilities to the Australian data ($N = 14{,}982$), a less problematic matter, leads to similar conclusions. Corrections for attenuation slightly increase the effect of parents' books (by 17%) and parents' education (by 2%). The effect of father's occupational status also increases slightly, unlike in the international data. Other effects are all small to begin with.

Overall, these analyses suggest that both parents' books and parents' education have strong, independent, and about equally large effects on children's education even after correcting for attenuation due to random measurement error. The effects are much larger than those of any other class or background variable we have measured.

### 7.7.3. *Omitted variables*

The Australian data allow us to introduce additional controls not available in the international data (Table A.8); they are based on 14,718 cases from a series of representative national samples conducted between 1984 and 2003. For the matters at hand, Australia is unexceptional, so there is a reasonable chance that the results will generalize to other countries (see Tables 1 and 3, Fig. 5, and Table A.3). In particular, the impact of parents' books on children's education is much the same in Australia (.69, corrected for attenuation) as in the pooled sample (.61). Corrected for attenuation due to random measurement error, our usual model implies that parents' books have a *standardized* effect of .27 on children's education, net of other things (Table A.8, column 2). We take this as the baseline and assess the effect of introducing further controls.

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### 7.7.4. Academic ability and father's scholarly habitus

One might have legitimate concerns that home library size was at least in part a proxy for respondent's academic ability – on the argument that intelligent parents buy more books than usual and have smarter children than average. We measure academic ability by a standard multiple-item test adapted for survey use (reliability $r = .53$ over a 5-year period). Alternatively, books might be a proxy for father's scholarly habitus, with fathers in occupations where books are common acquiring scholarly skills and preferences that lead them both to buy books and to further their children's educational careers. We measure habitus by the average home library size for people in father's 4-digit occupation.

Including these controls reduced the standardized effect of home library size (.27 in the base model) by about a quarter (to .20; Table A.8, column 3).[18] Thus the effects we have estimated in the main analysis would probably remain at least three-quarters of their present size, were able to control academic ability. So even with this possible reduction, the effects remain large and important.

### 7.7.5. Parents' income and wealth

Controlling for parents' income is not possible in the usual models based on retrospective reports of parents' characteristics because respondents' reports of their parents' income – unlike their reports of parents' education and occupation – are not reliable. An alternative to the retrospective approach is to take respondents as the parents and get child data from their proxy reports of their grown children's education, confining the analysis to children age 25 or older (column 4). We measure family income by respondents' reports of their current income, which are reasonably reliable ($r = .713$), taking that as a proxy for their income in the past when their children were growing up. This suggests that parents' income has a modest effect on children's education (.06). But even with the income control, the effect of home library size is significant and substantial (.15).

Further evidence comes from the OECD's PISA study of academic performance (reading and vocabulary tests) among high school students in over 40 nations, with over 200,000 cases (OECD, 2002). It has a plausible retrospective measure of parents' income and wealth based on a series of questions about possessions in the home.

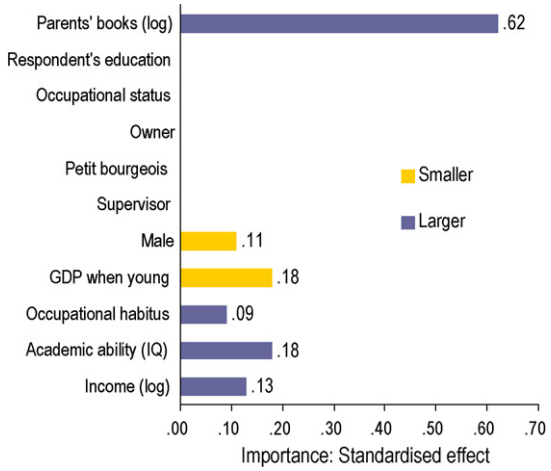


Fig. 6. Influences on home library size. Structural equation estimates correcting for random measurement error; Australia, 1984–2003; $N = .$

In these data (Table A.8, column 5), parents' income and wealth has a substantial effect on children's performance, .13 in standardized terms (Kelley, Evans, & Sikora, 2005). But even controlling for that as well as parents' education and occupation, home library size remains important, .25; indeed it has by far the largest effect.[19]

### 7.7.6. Respondent's marks/grades in school

One of the ways in which a home library might influence children's achievement is by improving their performance in school. Controlling for the usual variables plus academic ability and father's scholarly habitus, we find that books' effect is indeed strong and highly significant in Australia, as in the OECD data (column 6). In fact, it is second only to academic ability. This lends further strength to our causal interpretation of the association between scholarly culture and educational attainment.

### 7.7.7. The origin of home libraries

Where do libraries come from – who acquires a large library? The answer is unequivocal: a taste for books is largely inherited (Fig. 6 and Table A.8, column 7). Parents' library size is by far the dominant influence on one's own home library size, .62 in standardized terms (see also Crook, 1997a). Importantly, once other factors are

[18] This is probably an over-correction since it seems likely that there is some reciprocal influence between home library size and ability, which is beyond the scope of the present analysis.

[19] None of our data sets has information on personality, which might be relevant. However, a study in the Netherlands using standard multiple-item measures of the "big five" personality traits together with standard stratification-related measures, finds family background effects do not change when the personality variables are included (van Eijck & de Graaf, 1995).

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taken into account, education, occupational status, and class are irrelevant. Prosperous people buy more books, although not a lot more, .13. Academically able people buy many more books, .18. Working in a scholarly habitus also leads people to buy a few more books. Men buy fewer than women. Net of other things, young people growing up in recent years, when Australia's GNP was larger, themselves buy fewer books than comparable people in the past.

Thus it seems that scholarly culture, and the taste for books that it brings, flows from generation to generation largely of its own accord, little affected by education, occupational status, or other aspects of class. Academically able people, and those who work in a habitus infused with scholarly culture, sometimes join in. But the main story is continuity within the family. Parents give their infants toy books to play with in the bath; read stories to little children at bed-time; give books as presents to older children; talk, explain, imagine, fantasize, and play with words unceasingly. Their children get a taste for all this, learn the words, master the skills, buy the books. And that pays off handsomely in school.

## 8. Summary

In sum, we find that parents' commitment to scholarly culture, manifest by a large home library, greatly enhances their children's educational attainment. It does so not only in the rich, long-democratic, market-oriented nations of Western Europe and its overseas extensions, but also in Eastern Europe, in Asia, in South America, and in South Africa. The effect remains strong after controlling for well-known sources of educational advantage: parents' education, father's occupation, father's class and ownership situation, gender, GDP when growing up, and nation. Moreover, the effect is strong across the whole political spectrum – in every one of our 27 countries and as far back in history as our survey data can take us. It was strong in societies whose educational systems were redesigned explicitly to eliminate class privilege (Eastern Europe under Communism, China during the Cultural Revolution). It was strong among the underclass in a society designed to maintain group privilege (South African blacks under Apartheid).

Regardless of how many books the family already has, each addition to a home library helps the children get a little farther in school. But the gains are not equally great across the entire range; instead they are larger at the bottom, far below elite level, in getting children from modest families a little further along in the first few years of school. Moreover, having books in the home has a greater impact on children from the least educated families, not on children of the university educated elite.

Sensitivity analyses in one country where richer data are available (Australia) suggest that the strong impact of a home library persists even after controlling for random measurement error, academic ability, father's habitus, and parents' income. Moreover it suggests that scholarly culture, and the taste for books that it brings, persists from generation to generation within families largely of its own accord, independent of education and class.

## 9. Theoretical implications

Our preferred scholarly culture theory leads to three predictions, almost all supported by the evidence presented here. First, because scholarly culture provides skills and knowledge that are central to literacy and numeracy, and hence valuable in schools everywhere, it implies that parents' participation in scholarly culture will enhance children's educational attainment in all societies, net of the parents' formal education and social class (Hypothesis 1). As we have seen, the evidence strongly supports this hypothesis. Moreover it also suggests that social and economic policies have little effect on the advantages conferred by scholarly culture; instead, the advantage is large in all nations, at all times, under all political regimes. This does not mean that regimes do not try to use education to produce ideological conformity, but rather it suggests that scholarly culture confers skill sets that are valued regardless of the dominant ideology, something diaspora peoples have long known.

The results also support our prediction that an increase in scholarly culture has the greatest impact on children from families with little scholarly culture to begin with (Hypothesis 2). It is at the bottom, where books are rare, that each additional book matters most, not among the literate elite: each additional book yields more "bang for your book" among the book-poor than among the book-rich.

Further, scholarly culture matters more if parents are poorly educated, but matters less if parents are well-educated (Hypothesis 3). This is true for education as a whole (measured in years) and in the early stages of a child's educational career, around year 9. But, contrary to our hypothesis, it is not true for completing secondary school and quite the reverse is true for university.

All this suggests that scholarly culture provides skills and competencies that are useful in school, or that it reflects a preference for and enjoyment of books and reading that makes schooling congenial, or enjoyable.

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This may be one contributing reason why school reform is such a challenge. Ever since the original Coleman report, school effects on academic achievement are often found to be weak (Pong & Hao, 2007; Schneider & Keesler, 2007), dashing, or at least sobering, hopes that newer statistical methods would reveal substantial but previously undetected effects, and hence identify points of leverage. Note that our results do not in any way imply that formal schooling cannot compensate for the absence of scholarly culture in the home; but they do highlight the fact that children from homes lacking in scholarly culture may require special attention.

All this suggests that scholarly culture provides skills and competencies that are useful in school, or that it reflects a preference for and enjoyment of books and reading that makes schooling congenial, or both.

### 9.1. Cultural mobility

The cultural mobility thesis proposes that cultural skills and knowledge are not a monopoly of the elite nor a means of preserving privilege from one generation of the elite to the next (as Bourdieu would have it) but instead are widely available and perhaps especially valuable for children from modest families, contributing to their educational success and upward mobility (Aschaffenburg & Maas, 1997; Blaskó, 2003; DiMaggio, 1982; Kingston, 2001). This is a descriptive claim, without consensus among its adherents as to why culture is important, in what nations, or in which historical circumstances.[20]

Our data clearly fit this description: most of culture's effects are independent of family background and especially beneficial to children from modest families. This has important policy implications, suggesting that culture should be encouraged in schools, not scorned as irrelevant or as merely a tool for preserving elite privilege.

However, that is not the whole story: culture simultaneously helps to transmit advantage from one generation to the next. Further analysis (not shown) suggests that 25–35% of the advantage of growing up in a well-educated, high status family comes about indirectly because such families provide a richer cultural environment for their children, which in turn gives the children an enduring advantage in school. So scholarly culture produces both (much) cultural mobility and (some) inherited privilege.

[20] It is consistent with estimates that about 25% of the variance in school marks in the US is attributable to family factors other than academic ability and the usual stratification measures (Teachman, 1996).

## 10. Rejected alternative theories

### 10.1. Elite closure/cultural capital in the West

What does the evidence say about applying Bourdieu's "elite closure"/"cultural capital" theory about elites hoarding advantages by using essentially arbitrary cultural signals to recognize fellow members and to exclude others (Bourdieu, 1984; Goblot, 1925 [1973]) to the particular case of scholarly culture and educational attainment? Bourdieu envisions an elite, as arguably in France, with enough power to get its way in schools and universities; with a preference for furthering the interests of its own members; and living in a society where elite membership is recognizable by involvement in the scholarly culture. This is a plausible description of many developed Western nations, and so Bourdieu's thesis – like ours – implies that in these nations children from families with many books will get more education. And this they do.

Bourdieu's theory also implies that the payoffs go to children of the elite. But we have seen that children from poorly educated homes where books are scarce in fact benefit greatly, indeed more so than children from elite homes. For example, a child whose parents had no books and only a few years of education – about as far from the elite as you can get in the modern world – could expect to get 7.6 years of education, other things being equal. But if their parents had 25 books, that would rise to 9.8 years, more than 2 years higher. Thus, just a hint of scholarly culture conveys a large advantage to children from modest families. It is hard to see how this has anything to do with elite gate keeping: the parents might number among the respectable poor, but not among the elite. And the evidence in general is that scholarly culture's gains are manifest for children from families on the lower rungs of the social hierarchy, indeed generally greater for them than for children from higher ranking families. Elite closure cannot account for that.

It remains possible that elite closure operates in addition to other (more powerful) factors at university level. A small but statistically significant interaction points to scholarly culture mattering more for children from well-educated, possibly elite families. This is consistent with elite closure, but also with other hypotheses, for example the argument that educated parents are expert guides to the educational system, focusing their children's skills effectively (Lucas, 2001). In general, if completing university requires a combination of traits – say, ability, motivation, and financial resources – then there will be a positive interaction. Ability will matter most where

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there is also sufficient motivation and money; motivation will matter most when it is matched with ability; and so forth.

### *10.2. Elite closure/cultural capital under Communism*

If Bourdieu and other elite theorists from Mosca to Mills are right in thinking that ruling elites have power over schools and universities in (mostly pluralist and democratic) Western nations, then ruling elites in (centralized and authoritarian) Communist societies must have at least as much power, probably more. But when Communists were in power they did not favor children of the old regime, instead Communist elites favored workers, peasants, children from Communist families, and other politically approved groups. If home library size and the natural expressions of a way of life steeped in scholarly culture were simply signals, arbitrary markers of membership in the old elite, then they would certainly not have been rewarded under Communism (Connelly, 2000; Unger, 1982).

Thus, our finding that books in the home was just as much an advantage in different historical periods in Eastern Europe as in the modern West, and even more of an advantage in China (in both the urban and rural sectors), is especially revealing. First, it suggests that there is an intrinsic advantage in growing up around books, an advantage so great that it prevails even in the face of indifference or outright hostility from ruling elites, as during the Cultural Revolution in China. That the advantage is present for non-whites in the face of the white elite's Apartheid policies in past decades in South Africa is another striking example.

Second, since the advantage shows up in all Communist nations throughout their varied and checkered history, as well as in South Africa and the West, it is unlikely to be something mainly determined by government policies, even dramatic ones. Instead, it must reflect some fundamental cause common to a wide range of societies and diverse historical periods. We propose that it is an indicator of a cognitive toolkit that even the most ideologically driven societies cannot afford to ignore.

Third, since the advantage shows up just as clearly under Communism, where it cannot be attributed to the elite, as it does in the West, Occam's Razor suggests there is no need to follow Bourdieu and attribute the advantage in the West to elite machination.

We suggest that it is time to doubt Bourdieu's elite closure/cultural capital explanation of why scholarly culture matters to status attainment in the West. No serious analysis has ever supported the stronger forms of this thesis (Kingston, 2001)[21]. But the idea is so attractive that it has been tempting to dismiss contrary results as reflecting the peculiarities of the society investigated (most studies deal with a single country) or imperfections of data or method. But now that the theory's inadequacy has been demonstrated for dozens of societies, with diverse elites and varied institutions in diverse historical periods, the accumulation of contrary evidence should persuade its adherents to consider the alternatives. This does not rule out the possibility that elites use other "secret handshakes", but it is no longer plausible to interpret scholarly culture's impact on education as one of them.

## 11. Conclusion

We suggest that the standard model of educational attainment should be extended to include parents' scholarly culture, as measured by the number of books in the parents' home. Scholarly culture has a powerful impact on children's education throughout the world, in rich nations and in poor, under Communism and under capitalism, under good governments and under bad, in the present generation and as far back in history as now living memory can take us. It helps children from all levels of the social hierarchy, but especially those from the bottom. A book-oriented home environment, we argue, endows children with tools that are directly useful in learning at school: vocabulary, information, comprehension skills, imagination, broad horizons of history and geography, familiarity with good writing, understanding of the importance of evidence in argument, and many others. In short, families matter not just for the material

[21] Another weak variant of the thesis runs thus: Elites choose the content of "sorting" examinations in the educational system to suit themselves and therefore the content of the books that will be relevant to educational success (for example, Communists choose Marx, and religious elites choose St. Thomas Aquinas). We would not deny that they try! What our findings imply is that the cognitive gains from growing up in the scholarly culture are large enough that they dominate such attempts. The fact that the results reveal a substantial scholarly culture effect for black South Africans growing up under Apartheid (whose home libraries were surely not full of pro-Apartheid books) is strongly contrary to a theory implying that only books consistent with the dominant culture produce educational success. Similarly, the strong effect in China shortly after the Communist revolution (when few of these books would have been Communist classics) also supports the view that scholarly culture, regardless of its ideological orientation, confers skills that lead to educational success, regardless of the regime's ideological orientation. All this suggests that scholarly culture provides skills and competencies that are useful in school, or that it reflects a preference for and enjoyment of books and reading that makes schooling congenial, or both. This is not to say that the choice of reading matter does not vary by class, as it demonstrably does, for example in newspaper readership (Chan & Goldthorpe, 2007).

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resources they provide, not just because of parents' formal educational skills, but also – often more importantly – because of the scholarly culture they embody.

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## Appendix A.

See Tables A.1–A.8
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Table A.1
Measurement.

*Books in the parent's home* is measured as described in the text. We analyze the natural log (counting "no books" as 1).

*Education is* measured in years, with adjustments described in the text. *Year 9*, *Secondary*, and *University* are dummy variables scored 1 for those who completed that stage or higher and 0 for everyone else. Year 9 is around the end of compulsory education in many European nations and, even in recent decades, many end their schooling then; in poor countries and past generations, many did not even go that far in school. Secondary schooling finishes at 12 years in most nations. We define 16 years of education or more as university completion except for British-model educational systems (Australia, Cyprus, Great Britain, India, Ireland, New Zealand, Northern Ireland, and South Africa) where an ordinary university degree takes 1 year less. Russia has a compressed educational system with university following 10 years of primary and secondary schooling, rather than the 12 years usual in most countries, so we treat it like the British systems.

*Parents' years of education* were measured by questions appropriate to each nation and then recoded in the same way as respondent's years of education.

*Interaction*: Our main model uses an interaction = (ln number of books) × (parents' education)

*Father's occupational status* is coded from the surveys' original 4 digit International Standard Classification of Occupations (ISCO) or similarly detailed country-specific scores into Treiman's 14 category Standard International Classification of Occupations, and thence into Worldwide Status Scores (Kelley, 1990; Treiman, 1977). These scores order the 14 Treiman categories from 0 (farm laborers) through 1.0 (higher professionals). These scores are often used in international research (e.g. Kelley & Evans, 1995; Sikora, 2005) and in the US are essentially interchangeable with Duncan SEI scores.

The self-employed are all those working in their own business, farm, or professional practice, regardless of whether they are incorporated or not and regardless of whether the self-employed person receives their compensation in the form of salary, profit, or dividend. We define the *father petit bourgeois* as self-employed without employees and *father owner* as self-employed with employees that they supervise (Robinson & Kelley, 1979); these are mostly small entrepreneurs. These are treated as two separate dummy variables.

*Father supervisor* is scored 1 for fathers who supervise others at work and zero for fathers who do not, based on a direct question.

*Gender* is a dummy variable scored 1 for men and 0 for women.

*GDP per capita* when respondent was age 15 is measured at parity-purchasing-power and scored as an index with USA in 1995 = 1. GDP data for recent years are from the Penn World Table Version 6.1 (Heston, Summers, & Aten, 2002). The projection back into the past is based on Banks' cross-national time series (Banks, 1976), calibrated to Penn World Table definitions using the years that overlap, together with further assumptions by the authors. Some of our assumptions are heroic, but we believe our estimates are the best yet available. Technical details and a downloadable version of the database are available on our website, www.international-survey.org.

*Eastern Europe*. Residence in an Eastern European country is a dummy variable, scored 1 for Eastern Europeans and 0 otherwise. Preliminary analysis suggested that no other country groups require special treatment.

Table A.2
Books in parents' home and child's education: descriptive means and percentages, not adjusting for other differences. 31 societies, circa 1999.

| | Books in parents' home: | | | | | Difference: 500 − none |
|---|---|---|---|---|---|---|
| | None | Around 10 | Around 25 | Around 75 | Around 500+ | |
| Panel A: all nations | | | | | | |
| Education (mean years) | 6.8 | 9.0 | 10.8 | 12.2 | 13.7 | 7.0 |
| Grade 9 or more | 31% | 57% | 79% | 90% | 96% | 65% |
| Secondary or more | 12% | 24% | 40% | 58% | 78% | 66% |
| University | 3% | 5% | 9% | 19% | 36% | 34% |
| (Cases) | 7,309 | 16,937 | 11,655 | 23,816 | 13,070 | |

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Table A.3
Influences on education: multi-level linear and probit regression models (Panel A) and structural equation estimates correcting for random measurement error using Australian reliabilities (Panel B). Multiple imputation of missing data done separately for each nation. Pooled data from 31 societies. $N = 77{,}758$.[a].

| Variable | A. Multi-level linear and probit estimates (metric coefficients and *t*-statistics) | | | | | | | | B. Metric structural equation estimates (years of education) | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Years of education | | Complete Year 9+ | | Complete secondary+ | | Complete university | | World | | Change | Australia $N = 14{,}982$ | | Change |
| | *b* | *t* | *b* | *t* | *b* | *t* | *b* | *t* | Raw | Cor. | | Raw | Cor. | |
| Parents' books (log) | .78 | *65* | .24 | *36* | .16 | *25* | .12 | *13* | .55 | .61 | .07 | .52 | .69 | .17 |
| Parents' education (years) | .38 | *60* | .13 | *38* | .08 | *25* | .04 | *9* | .27 | .47 | .20 | .19 | .21 | .02 |
| Father's occupational status | 1.41 | *25* | .48 | *14* | .44 | *17* | .52 | *19* | 1.31 | .09 | −1.22 | 1.64 | 1.68 | .05 |
| Father owner (yes vs. no) | .22 | *5* | *ns* | *1* | .08 | *4* | *ns* | *3* | .22 | .62 | .40 | .03 | .02 | −.01 |
| Father petty bourg (yes vs. no) | *ns* | 1 | *ns* | −3 | *ns* | 1 | *ns* | 3 | ns | ns | – | −.13 | −.39 | −.26 |
| Father supervisor (yes vs. no) | .40 | *10* | .20 | *8* | .17 | *9* | .10 | *5* | .27 | −.52 | −.79 | .30 | −.05 | −.35 |
| GDP when R young | .90 | *28* | .35 | *22* | .19 | *11* | ns | *3* | .74 | .36 | −.38 | – | – | – |
| Eastern Europe (yes vs. no) | 1.11 | *20* | .31 | *11* | *ns* | *3* | ns | *0* | 1.43 | 1.06 | −.38 | – | – | – |
| Male (yes vs. no) | .59 | *28* | .22 | *20* | .14 | *14* | .19 | *16* | .58 | .57 | −.01 | .41 | .46 | .05 |
| (Interaction: row 1 × row 2) | −.036 | *−26* | −.008 | *−9* | *ns* | *1* | .006 | *6* | – | – | – | – | – | – |
| (constant) | 6.69 | *89* | −.46 | *−12* | −1.28 | *−33* | −2.33 | *−49* | 6.91 | 5.25 | −1.66 | 6.46 | 5.76 | −.69 |
| (std error of $u_i$) | (1.12) | – | (.58) | – | (.48) | – | (32) | – | – | – | – | – | – | – |
| (rho)[b] | (.14) | – | (.25) | – | (.19) | – | (.09) | – | – | – | – | – | – | – |
| ($R^2$ or pseudo $R^2$)[c] | (.44) | – | (.30) | – | (.25) | – | (.16) | – | (.44) | (.49) | | (.24) | (.27) | |

*ns*, not significantly different from zero at $p < .001$, two-tailed.

[a] Five multiple imputations were used for missing data in Panel A. Reliabilities are from Table A.8.

[b] Proportion of total variance contributed by second level variation.

[c] Correlation between the predicted value and the dependent variable, squared.

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Table A.4
Influence of books in the home and parents' education on respondent's education, raw and adjusted by the models of Table A.3 using whole population standardization. 31 societies, circa 1999.

| | Panel A. Actual (mean or proportion) | | | | | Difference 500 − 0 books | Panel B. Predicted (mean or proportion) | | | | | Difference 500 − 0 books |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | None | Around 10 | Around 25 | Around 75 | Around 500 | | None | Around 10 | Around 25 | Around 75 | Around 500 | |
| 1. Years of education | | | | | | | | | | | | |
| Parents: university | 12.6 | 13.4 | 14.0 | 14.6 | 15.2 | 2.6 | 12.7 | 13.1 | 13.3 | 13.5 | 13.8 | 1.1 |
| Parents: secondary | 11.3 | 11.8 | 12.3 | 13.2 | 14.0 | 2.7 | 11.1 | 11.9 | 12.2 | 12.6 | 13.2 | 2.1 |
| Parents: 7–9 years | 9.6 | 10.4 | 11.3 | 12.1 | 12.9 | 3.3 | 10.0 | 11.0 | 11.4 | 11.9 | 12.8 | 2.8 |
| Parents: primary | 8.5 | 9.3 | 10.4 | 11.2 | 12.2 | 3.8 | 8.8 | 10.1 | 10.6 | 11.2 | 12.3 | 3.5 |
| Parents: up to 3 years | 5.0 | 7.0 | 8.9 | 10.0 | 10.8 | 5.8 | 7.6 | 9.2 | 9.8 | 10.6 | 11.9 | 4.3 |
| 2. Complete year 9 | | | | | | | | | | | | |
| Parents: university | .84 | .94 | .97 | .99 | .99 | .15 | .89 | .94 | .95 | .97 | .98 | .09 |
| Parents: secondary | .82 | .91 | .95 | .97 | .99 | .17 | .78 | .88 | .91 | .93 | .97 | .19 |
| Parents: 7–9 years | .61 | .76 | .86 | .92 | .95 | .34 | .66 | .81 | .85 | .89 | .95 | .29 |
| Parents: primary | .41 | .55 | .71 | .81 | .86 | .46 | .53 | .72 | .78 | .84 | .92 | .39 |
| Parents: up to 3 years | .17 | .37 | .61 | .74 | .72 | .55 | .40 | .61 | .69 | .77 | .88 | .48 |
| 3. Secondary school | | | | | | | | | | | | |
| Parents: university | .74 | .82 | .84 | .88 | .92 | .18 | .49 | .65 | .71 | .78 | .87 | .38 |
| Parents: secondary | .49 | .61 | .64 | .75 | .84 | .35 | .36 | .52 | .59 | .66 | .77 | .41 |
| Parents: 7–9 years | .23 | .33 | .43 | .56 | .68 | .45 | .28 | .42 | .48 | .56 | .68 | .40 |
| Parents: primary | .14 | .22 | .34 | .44 | .57 | .43 | .20 | .33 | .38 | .45 | .58 | .37 |
| Parents: up to 3 years | .07 | .13 | .23 | .35 | .46 | .39 | .14 | .24 | .29 | .35 | .47 | .33 |
| 4. University | | | | | | | | | | | | |
| Parents: university | .21 | .32 | .38 | .48 | .58 | .37 | .08 | .18 | .23 | .30 | .45 | .37 |
| Parents: secondary | .11 | .13 | .16 | .26 | .37 | .26 | .06 | .13 | .17 | .22 | .34 | .28 |
| Parents: 7–9 years | .04 | .07 | .10 | .17 | .26 | .22 | .05 | .10 | .13 | .17 | .26 | .21 |
| Parents: primary | .03 | .05 | .08 | .12 | .22 | .19 | .04 | .07 | .09 | .12 | .19 | .15 |
| Parents: up to 3 years | .02 | .02 | .04 | .09 | .15 | .13 | .03 | .05 | .07 | .09 | .13 | .10 |
| Number of cases (Panel A) or 95% C.I. for predicted years of education (Panel B) | | | | | | | | | | | | |
| Parents: university | 19 | 108 | 149 | 1, 216 | 2,967 | | 12.6–12.8 | 13.0–13.2 | 13.2–13.3 | 13.4–13.5 | 13.7–13.9 | |
| Parents: secondary | 92 | 746 | 1,176 | 5, 204 | 4,406 | | 11.0–11.2 | 11.8–12.0 | 12.2–12.3 | 12.5–12.6 | 13.2–13.3 | |
| Parents: 7–9 years | 1,027 | 4,918 | 4,847 | 10, 958 | 4,246 | | 9.9–10.0 | 11.0–11.03 | 11.4–11.4 | 11.9–11.9 | 12.7–12.8 | |
| Parents: p×rimary | 2,064 | 5,156 | 3,286 | 4, 478 | 1,020 | | 8.7–8.8 | 10.1–10.12 | 10.6–10.6 | 11.2–11.3 | 12.3–12.4 | |
| Parents: up to 3 years | 3,876 | 5,463 | 1,877 | 1, 366 | 205 | | 7.5–7.7 | 9.1–9.2 | 9.8–9.9 | 10.5–10.6 | 11.8–12.0 | |

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Table A.5
Predicted years of education for respondents coming of age in different historical periods and different types of nation: regression estimates with multiple imputation of missing data. 31 societies; $N = 75{,}648$.

| Type of society | A. Predicted years of education other things being equal[a] and 95% confidence intervals | | | | | B. OLS Regression equation, with multiple imputation of missing values[b] | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | One book | 95% CI | 500 books | 95% CI | Difference, 500 books − one book | 95% CI | Parents' books (ln) | t | Parents' education (years) | t | Father' occupation (0–1) | Father owner | Father petty bourgeoisie | Father supervisor | GDP when R young (ln index, USA 1990 = 1) | Male | (Constant) | R-squared | (Cases) |
| A. Market economies | | | | | | | | | | | | | | | | | | | |
| Up to 1949 | 8.0 | 7.8–8.2 | 11.1 | 10.9–11.2 | 3.1 | 2.8–3.4 | .50 | 20.4 | .30 | 20.5 | 1.9 | ns | ns | 0.5 | 1.2 | 0.9 | 6.2 | .37 | 6,937 |
| 1950–1964 | 9.2 | 9.0–9.3 | 12.3 | 12.2–12.5 | 3.1 | 2.9–3.4 | .53 | 22.9 | .31 | 24.6 | 1.7 | ns | ns | 0.2 | 0.5 | 0.6 | 6.2 | .34 | 8,788 |
| 1965–1979 | 10.5 | 10.4–10.7 | 13.3 | 13.3–13.4 | 2.8 | 2.6–3.0 | .47 | 23.9 | .24 | 25.1 | 1.3 | 0.4 | ns | ns | ns | 0.3 | 7.5 | .26 | 11,136 |
| 1980 on | 11.7 | 11.4–12.0 | 14.2 | 14.0–14.3 | 2.5 | 2.1–2.8 | .41 | 11.9 | .28 | 19.8 | 0.9 | ns | ns | ns | ns | ns | 8.4 | .28 | 4,234 |
| B. Eastern Europe | | | | | | | | | | | | | | | | | | | |
| Up to 1949[c] | 8.4 | 8.3–8.5 | 11.5 | 11.3–11.7 | 3.1 | 2.8–3.3 | .49 | 23.9 | .30 | 20.1 | 1.5 | ns | ns | ns | ns | 1.5 | 5.0 | .34 | 7,632 |
| 1950–1964 | 9.9 | 9.8–10.0 | 12.9 | 12.8–13.0 | 3.0 | 2.8–3.2 | .49 | 28.0 | .20 | 17.7 | 1.2 | ns | -0.4 | 0.7 | ns | 0.6 | 8.5 | .29 | 10,254 |
| 1965–1979 | 10.8 | 10.7–11.0 | 13.5 | 13.4–13.6 | 2.7 | 2.5–2.9 | .44 | 28.9 | .22 | 22.6 | 0.9 | ns | ns | 0.4 | -0.3 | ns | 8.0 | .27 | 12,540 |
| 1980 on | 10.8 | 10.5–11.0 | 13.1 | 13.0–13.3 | 2.3 | 2.0–2.7 | .38 | 14.0 | .20 | 12.0 | 0.8 | ns | ns | 0.5 | ns | -0.3 | 8.2 | .27 | 3,689 |
| C. China | | | | | | | | | | | | | | | | | | | |
| Up to 1949 | 2.6 | 2.3–3.0 | 8.8 | 7.6–10.0 | 6.2 | 4.9–7.4 | 1.00 | 11.8 | .39 | 11.8 | *ns* | ns | ns | ns | –[d] | 2.4 | .6 | .39 | 598 |
| 1950–1964 | 3.5 | 3.3–3.8 | 10.6 | 10.1–11.1 | 7.1 | 6.5–7.7 | 1.15 | 22.5 | .29 | 6.4 | 1.5 | ns | ns | ns | – | 1.7 | 2.0 | .44 | 1,361 |
| 1965–1979 | 4.9 | 4.6–5.2 | 11.9 | 11.6–12.3 | 7.0 | 6.4–7.6 | 1.18 | 27.8 | .15 | 5.7 | 1.8 | ns | ns | ns | – | 1.5 | 3.2 | .39 | 2,490 |
| 1980 on | 6.2 | 5.7–6.6 | 10.7 | 10.3–11.1 | 4.5 | 3.8–5.3 | .80 | 13.7 | .20 | 7.1 | 1.4 | ns | ns | ns | – | 1.0 | 4.2 | .38 | 1,107 |
| D. South Africa: Non-white | | | | | | | | | | | | | | | | | | | |
| Up to 1949 | 3.8 | 3.6–4.1 | 8.3 | 7.5–9.1 | 4.5 | 3.5–5.3 | .65 | 8.4 | .44 | 11.1 | 2.4 | ns | ns | ns | –[d] | 0.8 | 2.0 | .39 | 885 |
| 1950–1964 | 5.4 | 5.2–5.7 | 10.2 | 9.7–10.6 | 4.8 | 4.2–5.3 | .75 | 13.7 | .36 | 11.1 | 2.0 | ns | ns | ns | – | 0.8 | 3.1 | .39 | 1,245 |
| 1965–1979 | 7.4 | 7.2–7.7 | 10.9 | 10.5–11.3 | 3.5 | 3.0–4.0 | .54 | 14.7 | .32 | 14.8 | 2.1 | ns | 0.8 | ns | – | 0.6 | 4.7 | .36 | 2,310 |
| 1980 on | 7.9 | 7.3–8.6 | 11.7 | 11.1–12.3 | 3.8 | 2.7–4.9 | .62 | 8.1 | .25 | 5.5 | *ns* | ns | ns | ns | – | ns | 5.9 | .30 | 442 |

[4] White South Africans are omitted.

ns, italicized coefficients are not significantly different from zero at $p < .01$, two-tailed (or $p < .001$ for samples over 5000).

[a] Other variables evaluated at the mean, separately for each type of society. For example, father's occupation in Panel A is evaluated at the mean for market economies.

[b] The predicted values in Panel A are from equations including an interaction between parents' books and parents' education. For clarity, this interaction is omitted from the equations in Panel B; hence the coefficient for parents' books reflects its unique effects, and similarly the coefficient for parents' education reflects its unique effects.

[c] Except Russia, which was already Communist

[d] Omitted in single nation analyses, as too few groups for reliable estimates.

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Table A.6
Influences on respondent's education in each nation separately: OLS regression estimates with multiple imputation of missing data. 31 societies, circa 1999. $N = 77{,}758$.

| Nation | Parents' books (ln) | *t* | Parent's education | *t* | Father's occupation | Father owner | Father petit bourgeois | Father supervisor | GNP when 15 | Male | (Constant) | (R-squared) | Cases |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| China: all | 1.13 | (41.91) | .17 | (9.36) | 1.53 | *ns* | −1.09 | *ns* | 1.08 | 1.50 | 6.69 | (.46) | 5,556 |
| China: rural born | 1.09 | (33.6) | .17 | (6.2) | 1.27 | *ns* | *ns* | *ns* | 1.65 | 1.90 | *ns* | (.42) | 3,740 |
| China: urban born | .98 | (20.0) | .15 | (6.4) | *ns* | −1.28 | −1.68 | *ns* | *ns* | .76 | *ns* | (.40) | 1,816 |
| Chile | .93 | (11.8) | .32 | (9.6) | 1.64 | *ns* | *ns* | *ns* | 3.57 | *ns* | 12.0 | (.53) | 1,192 |
| Spain | .82 | (10.1) | .50 | (11.7) | *ns* | *ns* | *ns* | *ns* | 2.77 | .88 | *ns* | (.59) | 1,016 |
| Cyprus | .72 | (8.0) | .29 | (7.4) | *ns* | *ns* | *ns* | .95 | 2.85 | .51 | *ns* | (.61) | 874 |
| Philippines | .67 | (7.5) | .26 | (7.4) | 2.38 | *ns* | *ns* | *ns* | 2.25 | *ns* | 12.8 | (.32) | 966 |
| Norway | .66 | (8.7) | .14 | (3.8) | 1.76 | *ns* | *ns* | *ns* | *ns* | *ns* | *ns* | (.26) | 1,100 |
| Israel | .66 | (9.9) | .21 | (5.4) | *ns* | *ns* | *ns* | *ns* | *ns* | *ns* | 8.3 | (.30) | 952 |
| Portugal | .65 | (10.2) | .39 | (10.0) | 2.16 | *ns* | *ns* | 1.20 | 2.30 | .98 | 6.5 | (.62) | 1,019 |
| South Africa: Asian | .63 | (8.5) | .23 | (6.6 | *ns* | *ns* | .68 | *ns* | 2.56 | 1.53 | 9.1 | (.46) | 658 |
| South Africa: Black | .60 | (20.3) | .36 | (19.9) | 1.67 | *ns* | .29 | *ns* | 1.95 | .47 | 7.0 | (.44) | 3,517 |
| Sweden | .58 | (6.7) | .19 | (3.8) | *ns* | *ns* | *ns* | *ns* | 1.95 | *ns* | 8.9 | (.25) | 964 |
| Hungary | .57 | (24.0) | .26 | (15.0) | .84 | −.48 | −.38 | .52 | .53 | .79 | 7.6 | (.42) | 5,461 |
| South Africa: all | .56 | (27.03) | .40 | (36.23) | 1.36 | .65 | .83 | 1.00 | 1.14 | .70 | 5.81 | (.57) | 6,992 |
| France | .56 | (8.8) | .17 | (6.3) | 1.40 | *ns* | *ns* | .13 | 1.30 | *ns* | *ns* | (.26) | 1,783 |
| Latvia[a] | .53 | (7.8) | .09 | (2.9) | *ns* | *ns* | *ns* | *ns* | *ns* | *ns* | 9.3 | (.18) | 951 |
| Poland | .52 | (20.0) | .21 | (12.0) | 1.46 | *ns* | *ns* | *ns* | 1.39 | .22 | 10.1 | (.40) | 4,103 |
| Slovakia | .52 | (21.4) | .23 | (11.7) | .92 | *ns* | *ns* | *ns* | .55 | .83 | 8.6 | (.31) | 5,318 |
| Slovenia | .45 | (7.2) | .26 | (5.3) | *ns* | *ns* | *ns* | *ns* | .91 | .54 | *8.3* | (.34) | 893 |
| Australia | .44 | (29.1) | .16 | (17.3) | 1.70 | *ns* | *ns* | .31 | 2.60 | .50 | 9.2 | (.31) | 14,982 |
| Russia | .44 | (15.1) | .18 | (11.2) | .85 | *ns* | *ns* | .47 | *ns* | *ns* | 9.9 | (.28) | 5,622 |
| South Africa: Colored | .44 | (5.8) | .35 | (10.2) | *ns* | *ns* | *ns* | *ns* | .96 | *ns* | 6.0 | (.47) | 707 |
| Germany-West | .43 | (7.0) | .33 | (6.9) | 1.48 | *ns* | *ns* | .16 | .80 | .13 | 6.5 | (.35) | 829 |
| New Zealand | .42 | (7.2) | .16 | (5.3) | *ns* | *ns* | *ns* | *ns* | 2.59 | *ns* | 11.2 | (.28) | 966 |
| Germany-East | .42 | (4.7) | *ns* | *ns* | *ns* | *ns* | *ns* | 1.03 | .72 | .62 | *ns* | (.17) | 456 |
| Bulgaria | .42 | (17.4) | .32 | (21.4) | *ns* | *ns* | *ns* | *ns* | .29 | .30 | 8.1 | (.41) | 4,450 |
| Czech Republic | .42 | (19.6) | .23 | (13.7) | 1.69 | *ns* | *ns* | .31 | .20 | 1.10 | 7.5 | (.29) | 6,861 |
| United States | .40 | (7.1) | .19 | (6.7) | 1.66 | *ns* | *ns* | *ns* | *ns* | *ns* | 9.3 | (.28) | 1,095 |
| Japan | .35 | (7.7) | .17 | (7.3) | .98 | *ns* | *ns* | *ns* | 1.03 | .74 | 10.5 | (.43) | 1,103 |
| Netherlands | .35 | (6.3) | .23 | (6.0) | 1.98 | *ns* | *ns* | *ns* | 2.29 | .74 | *ns* | (.20) | 1,434 |
| South Africa: White | .27 | (8.2) | .24 | (10.9) | 1.13 | .34 | *ns* | *ns* | .50 | .62 | 8.4 | (.27) | 2,110 |
| Canada | .25 | (3.5) | .14 | (3.6) | 1.99 | *ns* | *ns* | *ns* | 1.28 | *ns* | *ns* | (.19) | 820 |

*ns*, italicized coefficients are not significantly different from zero at $p < .01$, two-tailed (or $p < .001$ for samples over 5000).

[a] For clarity, the interaction between books and parents' education is omitted; it is small in all societies, although statistically significant in many. Thus the coefficient for parents' books reflects its unique effects, and similarly the coefficient for parents' education reflects its unique effects.

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Table A.7
Alternative measures of father's occupational status: ISEI scores and Worldwide scores. Estimated gain in education from various sources. Multi-level linear and probit regression models. Pooled data from 31 societies; $N = 49{,}294$ cases with complete information on all variables.[a].

| Variable (and comparison) | Treiman-Ganzeboom ISEI | | Kelley Worldwide scores[b] | |
|---|---|---|---|---|
| | *b* | *t* | *b* | *t* |
| Parents' books (ln; 500 books vs. 1 book) | .88 | 62 | .88 | 62 |
| Parents' education (15 years vs. 3 years) | .44 | 56 | .43 | 55 |
| Father's occupation (higher professional vs. farm laborer) | .03 | 27 | .02 | 31 |
| GDP when R young (USA vs. China) | .73 | 16 | .73 | 16 |
| Eastern Europe (yes vs. no) | .87 | 11 | .93 | 12 |
| Male (yes vs. no) | .40 | 16 | .40 | 16 |
| (Interaction: row 1 × row 2) | −.05 | −29 | −.05 | −30 |
| (constant) | 5.74 | 57 | 6.36 | 66 |
| (std error of $u_i$) | (1.14) | – | (1.14) | – |
| (rho)[c] | (.16) | – | (.16) | – |

ns, not significantly different from zero at $p < .001$, two-tailed.

[a] Probit estimates for completion of year 9, high school completion, and university completion also show that the Treiman-Ganzeboom and Kelley status scores are virtually interchangeable. Details are available on request.

[b] Predicted values using the Worldwide scores are correlated $r = .995$ with predicted values using ISEI scores.

[c] Proportion of total variance contributed by second level variation.

Table A.8
Extensions and sensitivity analyses: structural equation models correcting for attenuation due to random measurement error, estimated by maximum likelihood; standardized coefficients. Persons 25 and older. Australia, 1984–2003 (column 5 is OECD PISA data for 43 nations).

| Independent variable | Test–retest reliability[a] (1) | R's education (2) | R's education (3) | Son or daughter's education (4) | PISA: marks in school (5) | Australia: Marks in school (6) | R's books now[b] (7) |
|---|---|---|---|---|---|---|---|
| Parents' books (ln, metric) | .756 | .27 | .20 | .15 | .25 | .13 | .62 |
| Parents' education | .752 | .14 | .13 | .28 | .07 | ns | ns |
| Father's occupation | .809 | .16 | .24 | .10 | .17 | ns | ns |
| Father owner | .600 | ns | .08 | – | – | ns | ns |
| Father petit bourgeois | .485 | ns | ns | – | – | ns | ns |
| Father supervisor | .582 | ns | ns | – | – | ns | ns |
| Male | .988 | .09 | .06 | –.04 | – | −.07 | −.11 |
| GDP when young | –[c] | .29 | .36 | ns | – | .09 | −.18 |
| Academic ability (IQ) | .527 | – | .32 | ns | – | .27 | .18 |
| Father's habitus[d] | –[c] | – | ns | – | – | ns | .09 |
| ln income[e] | .713 | – | – | .06 | .13 | – | .13 |
| (R-squared) | – | (40%) | (50%) | (20%) | (22%) | (77%) | (61%) |
| (Cases) | – | 14,718 | 11,248 | 3,402 | 228,170 | 11,248 | 8,260 |

*ns*, coefficients in italics are not significantly different from zero at $p < .001$ (for large samples) or $p < .05$ (for samples under 5,000).

[a] Test–retest reliabilities are based on approximately 1,150 cases,varying slightly due to missing data, over a 5 year interval. The income reliability is over 2.7 years, based on 6,474 cases. For intelligence, the reliability is Cronbach's alpha, based on 16,090 cases. The reliability for respondent's education is .868.

[b] Books in respondent's home (ln). For this column, all variables except Row 1refer to respondent's characteristics, not to their parents' characteristics. Thus, row 2 is respondent's education, row 3 respondent's occupation, and so on. See Fig. 6 for details.

[c] Reliability not known; we have conservatively assumed .900.

[d] Average number of books owned for those in father's (4-digit ISCO) occupation.

[e] Not available for the usual analysis based on respondents' reports of their own education and their parents' SES. Available only for alternative analyses based on respondents' reports of their adult (age 25+) sons' and daughters' education and respondents' own SES in Col. 9. The reliability shown is therefore for respondents' own family income, not respondents' reports of their parents' income. For the OECD analysis, parents' income is proxied by a multiple-item scale of possessions.

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