



GEARY DISCUSSION PAPER SERIES

Do Teachers Make Better Parents?

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Do teachers make better parents?

-the differential performance of teachers' children at school.

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This paper investigates whether teenagers are educationally advantaged if their parents are educators, using PISA data for Great Britain and Ireland. It examines whether teachers' children do better at tests of reading ability. The results show that children whose fathers teach at third level or whose mothers teach at second level do better and these effects are greater than effects of sex or family structure. The paper also analyses whether teenagers are more likely to be helped with their schoolwork if their parents are educators. In both countries only mothers who are educators are more likely to do so. The evidence tends to suggest that where teenagers benefit from a parent as a teacher it is through specific assistance from the mother and a more general effect on the home environment from the father.

Keywords: teachers, PISA, parents, literacy

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1 Introduction

In the best of all possible worlds the educational attainment of young people would not depend on their socio-economic background. That this is not so is one of the most striking stylized facts of education around the world. There is a well-known positive association between the socio-economic background of parents and that of their children. This occurs for virtually any outcome of interest, such as education, education, income or occupation¹. Since education plays a vital role in individuals' life chances, the strength of the intergenerational link acts to limit equality of opportunity and maintain existing inequalities. An important question, therefore, is what are the channels through which parental advantage is maintained?

There are numerous possible mechanisms which could maintain intergenerational advantage from simple genetic transmission to a range of environmental variables include financial factors: better educated parents can afford more and better education for their children whether through direct costs of schooling or the indirect costs of moving to areas with better schools².

It seems unlikely that finance can explain all of the inter-generational correlation. A large body of evidence summarized in Heckman and Carneiro (2003) strongly suggests that for the US and Great Britain, only a small proportion of young people (less than 8%) are credit constrained with respect to going to college i.e. very few cannot go because of lack of money and that the effect of family background works primarily through more long run factors such as providing a home environment that fosters cognitive and other skills and is conducive to learning.

This suggests an important role for the home as a source of information. More educated parents are likely to be more aware of the value of education and how best to acquire it than those with less education. "Value" here does not simply refer to the

¹ See Chevalier, Denny and McMahon (2003) who document the degree of intergenerational educational mobility for 19 countries. The OECD(2001) report on PISA shows that better school performance is correlated with a measure of domestic wealth in 31 countries 'though the extent of the association varies considerably, see Table 6.2 page 286.

² There are numerous papers documenting the price premia that attach to houses which are close to good schools, see Gibbons and Machin (2003) for a recent British study.

direct economic gains from education but also cultural and social benefits. In addition, more educated parents may simply know more, at least in an academic sense.

So if middle class parents have “inside information” which they can pass on, what exactly is it and how do they do so? To get a handle on one aspect of this, this paper considers a particular group of parents, namely, those who are educators³. One can intuitively think of several reasons why the children of teachers will do particularly well at school.

Firstly, there could be a genetic explanation. If teachers are genetically more intelligent or have a more positive attitude to education then one would expect this to be passed on, at least partially, to their offspring. This paper is unable to consider whether there is a genetic basis for any effects but it does not seem particularly plausible at least given our present state of knowledge of the human genome.

A second factor is that parents who are educators may offer specific help to their children by making use of their knowledge of the curriculum, the education system generally and their, hopefully more sophisticated, teaching abilities. Thirdly, leaving aside these fairly specific advantages, educators are, one expects, likely to instil a favourable attitude to learning at home and to facilitate their children’s education generally. The recent revival of interest in “social capital” has emphasized the importance of networks and of other forms of informal association. Clearly the family as a network, “familial capital” perhaps, is likely to be especially vital for younger individuals when they have less opportunity to enter or form other networks. Not surprisingly, there is a vast body of research showing the importance of family background and structure on educational, behavioural and other outcomes for children.

Finally, teachers may make better choices with regard to their children’s schools. School quality has an influence on educational attainment important and educators are likely to have better information on school quality particularly if they work in the same level (primary, secondary etc) that their children are attending. The effect of school quality, for example as measured by class size, teacher qualifications

³ This paper used “educators” and “teachers” synonymously i.e. those who teach at first, second or third level.

on educational attainment has not generated a consensus, Heckman and Masterov (2005) provide a recent overview. They argue that school quality effects do matter, specifically that better teachers improve educational outcomes, but that policies to reduce class size are unlikely to be effective.

The importance of any school quality effects depends on the extent to which parents have choice over which schools to send their children and on the extent to which information on school quality is publicly available. For example extensive information is available on English schools through the schools inspectorate, OFSTED which publishes whole school reviews and the Department for Education and Skills which publishes school “league tables”. In Ireland by contrast, no information on school outcomes, whether qualitative or quantitative, is available⁴. However, aside from the type of data that can be included in such sources, informal knowledge about schools may be important and access to such information is likely to be very unequal since such knowledge tends to be transmitted through informal networks, “social capital” in contemporary parlance. It seems plausible that education professionals will in general be better informed than many other parents and this inequity is exacerbated when other information is censored.

With regard to choice, the education systems are quite different in Great Britain and Ireland. Education is devolved to Local Education Authorities with defined catchment areas for state schools. In Ireland the education system is controlled by central government and parents are somewhat freer in sending their children to schools outside their immediate locality. In both countries there is a significant private school sector with the dividing line between private and public schools less well defined in Ireland. For example all teachers, including those teaching at private schools, have their salaries paid by the state and hence are required to have the same qualifications as those at state schools.

⁴ See www.ofsted.gov.uk and www.dfes.gov.uk/performance/tables/ for data on England. Links to similar data for other countries can be found at www.ucd.ie/economic/staff/kdenny/Schooldata.htm. In Ireland, the Education Act of 1998 gives the Minister for Education the right to refuse to publish any information that would make permit comparisons of schools, a right that has been consistently exercised.

This paper attempts to measure the educational benefit, if any, to children of having parents who are teachers. This is done in two ways. Firstly the paper estimates models explaining the students' scores on reading tests including indicators of whether their parents are educators while controlling for a wide range of covariates. Secondly models of the frequency with which the respondents are helped with their schoolwork by their parents are estimated; again with indicators of whether their parents are educators and controlling for a wide range of covariates.

I am unable to locate any other research on these or similar lines. An analogous question would be whether the health of the children of physicians differs from those of non-physicians. While there is a considerable research literature on how physicians and their families interact with healthcare systems, whether their children's health is better on average is unclear from the results⁵.

In comparing the results across two countries not only must one remember that the education system is different but so too is the labour market for teachers. Teaching may well attract different types of individuals in two countries depending on the incentives to join the profession and the ease with which one can do. It is not possible here to make a comparison of the market for teachers in Ireland and Great Britain⁶. Some useful information can be gleaned from a recent OECD *Education at a Glance* report that shows that after 15 years of experience a primary or secondary teacher in Britain earns about 46% more than Gross Domestic Product (GDP) *per capita* whereas the comparable figure in Ireland is 23%⁷.

The absolute levels of salaries (taking account of Purchasing Power Parity) are very similar so it is largely higher GDP *per capita* in Ireland that is the cause of this. However Gross National Product (GNP) provides a better indicator of standard of living than GDP and in 2003 GNP in Ireland was 72% of GDP whereas in Great Britain it was 94% so the OECD comparison significantly exaggerates the difference between the relative living standards of teachers⁸.

⁵ See for example Wasserman, Hassuk, Young and Land(1989) or Richards (1999)

⁶ Chevalier and Dolton (2005) describe the labour market for teachers in Britain. I am unaware of a comparable analysis for Ireland.

⁷ OECD (2003) Table D5.1, data refers to 2001.

⁸ www.worldbank.org/data/countrydata/countrydata.html : World Bank Development Indicators.

2 Data and estimation methods

The data used here is drawn from the Program for International Student Assessment (PISA), which collected data on students' performance in reading, mathematical and scientific ability as well as an extensive array of contextual information at the level of the student and of the school. It was collected by the OECD in 2000 and released in 2001. A further wave collected in 2003 has been released this year. Data on 32 countries in all are available; the total number of observations is 174,896. The average sample size is around 5,000 per country though the median is somewhat smaller with Canada and Great Britain having particularly large samples. The data is cross sectional and this of course imposes limits on the analysis. It is not possible to allow for dynamics of any form, for example to analyse the effects of changes in the independent variables over time nor is it possible to control for unobserved heterogeneity as one could with longitudinal/panel data. It would be useful if, in our data, one could track the consequences for children as their parents enter or leave the teaching profession.

This paper uses the data from Ireland and Great Britain (that is England, Scotland and Wales). The students sampled were almost all 15 years old at the time, a small number being slightly older or younger. All students were tested for reading abilities assessed in three dimensions: retrieving information, interpreting information and reflecting and evaluating information. These in turn are aggregated into an overall reading score. A subset was also tested for mathematical ability and another, partly overlapping, subset tested for knowledge of science.

The main outcome of interest is the students' performance on the average score on the reading test. Some results on behavioural outcomes will also be presented. The first model to be estimated for each country is:

$$\text{Log } Y_{is} = \beta X_{is} + \delta Z_s + u_{is} \quad (1)$$

where $\text{Log } Y_{is}$ is the natural logarithm of the reading score of the i 'th student in the s 'th school, X_{is} is a vector of observations on the variables of interest and on a

set of control variables. Z_s is a set of dummy variables indicating the school they attended. Estimation is by Ordinary Least Squares and the estimated standard errors are robust to arbitrary forms of heteroscedasticity using the standard Huber/White “sandwich” estimator. The logarithmic transformation of the reading score is used because one can interpret the estimated coefficients as giving marginal proportionate effects. Using a linear specification of the dependent variable leads to qualitatively similar results.

In PISA, the data on reading scores are collected in the form of five “plausible values”, five scores that are equally likely. The dependent variable is the mean of the five although one could use just any one score. Sampling weights, provided with the data at the level of the individual student, are utilised in estimating both sets of models. The sampling procedure is based on a two-stage process with the school being the primary sampling unit so observations should be independent between but not necessarily within school. One method to correct the estimated standard errors (which are otherwise likely to be underestimated) is to use the jack-knife estimator. This is somewhat cumbersome so this paper estimates the covariance matrix allowing for clustering at the level of the individual school⁹.

In section 3 we estimate ordered probit models in which the dependent variable is a categorical variable indicating the frequency with which respondents are helped with schoolwork. It is assumed that there is an underlying score which is a linear combination of the independent variables and a set of cut-off or threshold points. The probability of observing outcome i is equal to the probability that the estimate of the linear function, plus a random error term, is within the range of estimated cut-off points:

$$\Pr(outcome_j = i) = \Pr(\gamma_{i-1} < \beta X_j + u_j \leq \gamma_i) \quad i = 1 \dots I \quad (2)$$

X here denotes a matrix of observations on the variables of interest as well as control variables (including school effects) and β is a vector of parameters to be

estimated. The error term u_j is assumed to be normally distributed and the model is estimated using conventional Maximum Likelihood methods¹⁰. Where there are I possible outcomes, the cut-off points $\gamma_1, \gamma_2, \dots, \gamma_{I-1}$ are estimated and γ_0, γ_I are taken as $-\infty, \infty$ respectively. Assuming the error term to have a logistic distribution leads to ordered logit which usually leads to very similar results.

A useful way of thinking of these ordered response models is that there is an underlying latent variable – in this case the true frequency of receiving help- which is not observed in the data and which is assumed to be a linear function of the X 's. If a particular parameter in β is estimated to be positive, this means that an increase in the corresponding X shifts the distribution of the latent variable to the right.

This has unambiguous effects on the probability of the two extreme categories: the first (leftmost) falls and the last increases. However the probabilities of the intermediate outcomes can go up or down and need to be numerically evaluated¹¹. Specifically the marginal effect of a change in a variable X_k on each of the probabilities is the product of the corresponding coefficient and a scale factor:

$$\begin{aligned}\frac{\partial p_1(X)}{\partial x_k} &= -\beta_k \cdot f(\gamma_1 - \beta X) \\ \frac{\partial p_I(X)}{\partial x_k} &= \beta_k \cdot f(\gamma_{I-1} - \beta X) \\ \frac{\partial p_i(X)}{\partial x_k} &= \beta_k \cdot (f(\gamma_{i-1} - \beta X) - f(\gamma_i - \beta X)) \quad 1 < i < I\end{aligned} \tag{3}$$

where $f(\cdot)$ is the normal density function. What one can say, is that “high” values of the dependent variable become more likely and “low” values less likely. However which categories of the dependent variable count as “high” and “low” is an empirical issue. Assume for example there are five categories: it could be the case that

⁹ This paper follows Schnepf (2002) who also uses the PISA data and finds that the “clustering” approach followed here leads to very similar results to the jack-knife method.

¹⁰ The ordered probit model was introduced by Aitchison and Silvey (1957)

¹¹ Greene (2000) pp 877-878 states the problem clearly and questions the usefulness of the estimated coefficients in ordered probit. Some statistical software, such as Stata, allows one to calculate average marginal effects.

the first two become less likely and the last three become more likely or it could be the first three and last two and so on.

For any two variables in a given model, the scale factor in (3) is common so one can compare the relative size of the marginal effects of two variables on the probability of any outcome by taking the ratio of the corresponding coefficients¹²:

$$\frac{\frac{\partial p_i(X)}{\partial X_k}}{\frac{\partial p_i(X)}{\partial X_l}} = \frac{\beta_k}{\beta_l} \quad (4)$$

The two equations, (1) and (2) are estimated separately. However one could argue that they should be estimated jointly and that each dependent variable should feature on the left hand side of the other equation. Students with lower scores are more likely to receive help from their parents and those who receive help are likely to get higher scores, other things being equal. If one includes the outcomes in (2) on the right hand side of (1) one estimates well determined negative coefficients reflecting, presumably, parents' greater willingness to help their children with lower ability. While the non-linearity in (2) means that neither equation is nested in the other, to estimate the equations as a system plausibly, requires identifying assumptions and, rich though the dataset is, there are no convincing exclusion restrictions. For this reason they are estimated separately.

PISA is an unusually rich data source so there are a large number of potential control variables. I include controls for sex, family structure, sibship size and several measures of whether the home environment is likely to be "education friendly". Direct measures of parental education and parental occupation are also included. The information on parental occupation is provided by the student and is then coded according to the ISCO 1988 classification to 4-digit level. Broadly speaking the first digit is a decreasing indicator of occupational prestige, so 2 represents professionals and 9 (the omitted category) represents labourers for example.

Educators are represented by the first two digits 23, the third digit indicates whether primary, secondary and third level. A further category of "education

¹² See Stewart(2004) for example. The extension to discrete independent variables is straightforward.

professionals” (including school inspectors) exists in the data but they are few in number and their inclusion does not change the results. The fourth digit provides some further detail. Because of small cell sizes no use will be made of 4-digit detail. Descriptive statistics are given in Tables 1 and 2. One feature worth noting from Table 1 is that that teaching at secondary and especially primary level is much more common amongst women whereas the reverse is true at third level.

3 The effects on reading scores

There are several ways in which young people’s education might be associated from having a parent as an educator since clearly educators differ from other parents in a number of respects which are not necessarily due to them being educators *per se*. By controlling for these confounding factors, for example their education level, one can rule out some spurious explanations for the association. For each of the two countries, a series of models is presented. The first model includes only binary variables, for each parent, indicating whether they teach at primary, secondary and third level. The second model adds controls for school effects: the Z ’s in (1). This will reflect the extent to which children are in better or worse schools. In the third column controls for parental education and occupation are added – no data on parental income is available.

For occupation, there are nine categories corresponding to the first digit of the ISCO classification. To save space, only the parameter estimates for the category to which teachers belong (professionals) are included in the tables. The omitted category is “labourer”. For parental education, data is provided using the OECD’s ISCED classification in six categories (five in Ireland). Again to save space, only the coefficient for graduates is included. The omitted category is “did not go to school”. The final column adds a range of variable pertaining to either the individual student or his/her family. Clearly the order in which variables are added as one moves from specific to general is somewhat arbitrary.

Looking at the results for Ireland in Table 3, the first column indicates a strong association between having either parent as an educator (at any level) and

performance on reading tests. The typical marginal effect is around 10% and for a father being a third level educator the effect is 14%. All are statistically significant at least at the 5% level and are quite large in magnitude. Controlling for school effects changes the picture however. While all but one of the effects remains statistically significant the magnitudes are reduced, typically by around 3 percentage points. Moreover while the first model only explained 2% of the variation in the dependent variable, this rises to almost 20% once schools effects are added.

Adding controls for occupational grouping and education in the third column has the most dramatic effect on the results. Only two of the parameters of interest, mother as secondary teacher and father as a third level educator, remain statistically significant. The sizes of the effects are also smaller at about 6%. One can see that much of the apparently large effect of the teacher variables was due to the occupational grouping to which they belong: having a father who is a professional raises one's test score by almost 9% and the equivalent figure for one's mother is just over 6%. Having a father who is a third level graduate also conveys a large premium on the child's reading score, almost 13%.

Adding the final set of six controls which largely relate to the home environment do not change the results fundamentally aside from further lowering the effect of the mother as secondary teacher to about 4%. Many of the other coefficients are as one expects: girls do better, children with more siblings do worse as they have more competition for family resources and the number of books in this house has a strong association with higher test scores¹³. Of course this result does not mean that parents can boost their children's school performance by simply investing in large quantities of books. Rather, it should be interpreted as an indicator of a home environment that is conducive to education. The cultural communication variable is

¹³ The data in PISA on number of books is based on a categorical variable with 7 ranges. For simplicity this was converted to a scalar by using the mid-points of the ranges. For the top category, 500+ , I chose 600 as a mid point. Since this procedure introduces measurement error the estimated coefficient is likely to be underestimated. Using dummy variables for the categories generates very minor changes in the parameters of interest.

an index based on the frequency with which the respondents engage with their parents in a variety of ways¹⁴.

Intuitively one might expect having parents as secondary school teachers to be the most advantageous since these students are at secondary level. This is only partly borne out by the results. Whether the benefit of fathers as third level educators is because they help their children directly or some more general effect is explored in section 4.

The results for Great Britain are presented in Table 4. Perhaps the most striking feature of these results is that they are quite similar to those for Ireland. With no other controls, all the teacher variables are statistically significant and are of comparable magnitude to those in Table 3. Adding school effects again increases the proportion of the variation explained by the model by about 20% and reduces the size of the teacher effects by a few percentage points. Including the additional controls leaves one with similar results to those in Ireland: having a father as a third level teacher and a mother at second level has well determined effects on the dependent variable. The sizes of these two effects are almost the same as in Ireland, about 5% and 3.5% respectively. The only difference is that there is also a benefit to having a father who is a second level teacher.

While the effect sizes in Tables 3 and 4 may seem small in absolute magnitude, when they are compared to some of the other coefficients in the table the picture is changed. For example, from column 4 in Table 3, one can see that the benefit of having a father as a third level teacher (+6.8%) is almost twice the disadvantage associated with being a boy (-3.8%). In Great Britain, having a mother who is a secondary teacher more than compensates for the disadvantage of being from a single parent household (+3.6%, -2.7% respectively).

Why the results should be so similar across countries is not clear. The two educational systems are quite different in most respects, for example the degree of local control, financing of schools, student assessment. It is arguable, then, that the commonality of the results arises from similarities in intra-family relations between

¹⁴ Specifically: on the frequency with which they discuss political or social issues, discuss film, books or television or listen to classical music together, see OECD(2002) p31.

the two countries. It would be interesting to repeat this exercise on some of the other twenty countries in the PISA data many of which have very different social and familial traditions.

If there was a general benefit from having a parent as an educator due to there being an education-friendly environment at home, one would expect this to be true whatever level the parent taught at. If the benefit was “specific” in the sense that it depended on direct knowledge of the curriculum then one would expect it to depend on the level at which the parent taught. It seems plausible that the effect would be greatest for secondary teachers since the students are at that level. It is arguable that it would be greater for primary teachers than those at third level since many of the latter are primarily interested in research rather than teaching *per se* and they rarely possess any significant degree of training in teaching. These arguments are only partly borne out by the results. The absence of any effect from primary teachers is surprising ‘though there are very few males in this category.

There is no obvious explanation for the differences between the effects of fathers and mothers. It may be that one parent has more time to help their offspring. It seems plausible that even when both parents are working that the mother does more of the housework on average: this would suggest a greater scope for paternal involvement in education at home. Whether this is actually true is another matter. In the survey students were asked how often their parents and other family members helped them with their schoolwork. The next section models the frequency with which the respondents are helped by each of their parents and how this depends on whether their parents are educators or not.

4 The effects on the frequency of being helped with school work

Students were asked how often they were helped with schoolwork by both of their parents. The choices available to the respondents were: never or hardly ever, a few times a year, about once a month, several times a year, several times a week. The marginal distributions are given below in Table 2. The determinants of this variable are modelled using ordered probit.

The same controls are used as in the models of students' reading ability. In modelling each parent's frequency of helping, indicators of both parents' occupation are included since there may be some substitution between the two. Looking at Table 5 one can see that in both countries, that fathers are as likely to help their sons as their daughters whereas mothers are more likely to help their daughters. The coefficients of interest are the first six parameters. In Ireland, being a teacher at any level has no statistically significant influence on whether a father helps their offspring at school. By contrast, whether the mother teaches at first, second or third level makes them more likely to help. For neither parent is there any evidence of substitution effects: whether the *other* parent is an educator is irrelevant.

If one considers the occupational grouping effects, there is a rather curious result¹⁵. Whether a father is professional or not has no effect on whether they help their children but they are less likely to do so if the mother is a professional. The converse is also true for mothers; that is each parent puts in *less* effort when the other parent has a relatively high status job. Presumably this is because as there is a higher opportunity cost to their time they need to spend more time in other household duties and hence have less time to help their children. The older a student is the less likely they are to get help and in Great Britain a higher number of siblings also had this effect. The age effect is striking because there is very little variation in the respondents' ages. Even teenagers who are a few months older are less likely to be helped by either parent. Two indicators of having an environment that is conducive to education, the number of books in the house and the index of cultural communication are consistently associated with a greater frequency of help while single parenthood has, not surprisingly, the opposite effect¹⁶.

Using equation (4) one can see that in Ireland, having a mother as a secondary teacher has a 6% bigger effect on the probability of any given outcome than if the mother is at third level ($1.06=0.688/0.648$) where as in Great Britain, the corresponding figure is close to -20% ($0.81=0.363/0.449$).

¹⁵ As in Tables 3 and 4, the other occupational and parental education effects have been omitted for the table.

¹⁶ The effects of single parenthood on children has been widely studied, for example Carlson and Corcoran (2001).

Can these results help one interpret the results in Table 3? No simple explanation is possible: the beneficial effects on literacy of a father at third level does not appear to be as a result of direct assistance with school work so this suggests that there is some more general influence at work. Mothers who are educators spend more time helping their children, but it results in better academic performance only if they are secondary teachers. It is possible that it results in better performance in dimensions not studied here such as mathematics or science.

An alternative explanation is the mothers choose whom to help partly on the basis of their general academic ability. If they are more likely to help their children if they are academically weaker then one may observe no effect in the data since effectively the maternal help acts to compensate for a variable that is not observed in the data, their innate ability. Estimating the two outcomes (equations (1) and (2)) simultaneously might throw some light on this issue but it is unclear how one could do this credibly with the data available.

Turning to the results for Great Britain, one finds that, as in section 3, they are very similar to those for Ireland. Being an educator at any level has no influence on whether a father helps their offspring at school whereas if the mother teaches this makes them more likely to help. Where children benefit from having a father as an educator it does not appear to be because of direct assistance with school-work. Mothers as educators are more likely to assist their children but it is not always associated with better reading scores.

It was shown earlier that parents in general are more likely to help their children if the other parent has a high status job and this suggests that demands on parental time may be a constraint on helping children. The negative effects of single parenthood and sibship size also point in this direction. If this were the case then one would expect the labour market status of parents to have an effect. However it was found in the preliminary analysis of the data that whether a parent was full or part-time employed or a home-maker made little difference and these variables were therefore excluded from the final analysis so a simple time constraint argument is not supported.

5 Conclusions

The extent to which the academic achievement of young people is determined by their parents' socio-economic background provides, to some extent, a barometer of the degree of educational and social mobility in a society. That the children of the better off or more educated do better in school and in life in general is well established but the relationship between the two is in many respects a black box: there can be many reasons why advantage is transmitted across generations. It is difficult to identify the separate roles of parental income and education, familial influences on attitudes, neighbourhood effects and school quality as they are highly correlated.

This paper looks at one particular strand within the black box by investigating whether children are advantaged if their parents are teachers and if so, through what mechanism. There are well determined, 'though quantitatively small, advantages to having a parent as an educator principally if the parent is a second level teacher or the father is a third level educator. The size of the effects are, however comparable and in many cases greater than other sources of educational inequality such as sex differences or living in a single parent household, variables which have been very widely studied.

The evidence points to benefits that are partly specific, arising from direct help from a parent/teacher and partly a more general effect, likely to be associated with providing a more education-friendly household. When we examine specifically whether educators help their children with schoolwork, the results are broadly in line with this. Only mothers who are educators (at any level) help their children more and this explains some of the higher reading scores. Since the fathers are no more helpful than non-educators, the advantage they provide to their children must be through some other means such as contributing to a more pro-education environment above and beyond that which is controlled for in the estimation. That the results are very similar for two countries, Great Britain and Ireland, with very different educational systems suggests it is commonalities within the family that are at work.

Table 1: Descriptive statistics

	Ireland		Great Britain	
	Mean	Std.Dev.	Mean	Std.Dev.
Reading score	530.032	90.738	533.873	95.502
Log of reading score	6.257	0.184	6.263	0.193
Mother primary teacher	0.032	0.176	0.047	0.211
Father primary teacher	0.005	0.067	0.005	0.074
Mother secondary teacher	0.021	0.143	0.026	0.158
Father secondary teacher	0.017	0.128	0.019	0.137
Mother 3 rd level teacher	0.003	0.053	0.008	0.089
Father 3 rd level teacher	0.006	0.075	0.011	0.104
Father graduate	0.273	0.446	0.360	0.480
Mother graduate	0.276	0.447	0.404	0.491
Father professional	0.099	0.298	0.157	0.364
Mother professional	0.181	0.385	0.211	0.408
Girl	0.523	0.500	0.507	0.500
Age	15.699	0.284	15.638	0.288
Number of siblings	2.590	1.393	2.023	1.328
Log (number of books)	4.447	1.435	4.492	1.438
Single parent family	0.094	0.291	0.147	0.354
Parental cultural communication	-0.082	0.957	0.019	0.917
N	3555		7721	

Note: The descriptive statistics in Tables 1 and 2 are unweighted. The sample is for that used in column 4 in Tables 3 and 4.

Table 2: Frequency with which parents help their children with schoolwork

	Ireland				Great Britain			
	Father helps		Mother helps		Father helps		Mother helps	
Never/hardly ever	1427	41%	1247	35%	2239	30%	1856	25%
A few times a year	872	25%	888	25%	1305	18%	1214	16%
About once a month	496	14%	545	15%	1336	18%	1484	20%
Several times a month	488	14%	559	16%	1571	21%	1808	25%
Several times a week	224	6%	298	8%	900	12%	1013	14%
Total	3507	100	3537	100	7351	100	7375	100

Note: These tabulations are for the samples used in the models in Table 5. Percentages may not add up due to rounding.

Table 3: Results for Ireland
Dependent variable: log of reading score

	1	2	3	4
Mother primary teacher	0.056 3.23**	0.034 1.98*	0.002 0.12	-0.001 0.09
Father primary teacher	0.098 2.49*	0.094 2.70**	0.05 1.29	0.047 1.41
Mother secondary teacher	0.117 7.17**	0.091 5.32**	0.059 3.50**	0.039 2.38*
Father secondary teacher	0.095 5.52**	0.071 3.67**	0.03 1.39	0.02 0.93
Mother 3 rd level teacher	0.098 2.18*	0.055 1.37	0.028 0.72	-0.005 0.11
Father 3 rd level teacher	0.138 5.27**	0.097 3.70**	0.062 2.13*	0.068 2.23*
Father graduate			0.128 2.77**	0.104 2.47*
Mother graduate			0.068 1.45	0.038 0.77
Father professional			0.091 5.28**	0.074 4.39**
Mother professional			0.068 6.79**	0.052 5.36**
Girl				0.038 4.26**
Age				0.042 3.56**
Number of siblings				-0.011 4.65**
Log (number of books)				0.025 10.20**
Single parent family				-0.013 1.26
Parental cultural communication				0.013 3.67**
Parental education effects	No	No	Yes	Yes
Occupational effects	No	No	Yes	Yes
School effects	No	Yes	Yes	Yes
Constant	6.247 924.15**	6.249 8674.66**	5.961 95.65**	5.268 26.68**
Observations	3555	3555	3555	3555
R-squared	0.02	0.19	0.24	0.29

Notes: Robust t statistics in parentheses. * significant at 5%; ** significant at 1%. Regressions are weighted.

Table 4: Results for Great Britain
Dependent variable: log of reading score

	1	2	3	4
Mother primary teacher	0.103 8.43**	0.067 4.95**	0.026 1.69	0.016 1.07
Father primary teacher	0.049 2.24*	0.015 0.4	-0.011 0.34	-0.01 0.35
Mother secondary teacher	0.127 8.31**	0.086 5.96**	0.047 2.96**	0.036 2.20*
Father secondary teacher	0.104 4.83**	0.08 5.08**	0.052 2.80**	0.054 2.56*
Mother 3 rd level teacher	0.091 4.15**	0.041 1.81	0.011 0.46	0.007 0.28
Father 3 rd level teacher	0.134 5.26**	0.086 3.43**	0.05 1.94	0.049 2.06*
Father graduate			0.026 0.47	0.009 0.16
Mother graduate			0.061 0.93	0.04 0.61
Father professional			0.093 6.66**	0.073 5.58**
Mother professional			0.099 7.16**	0.084 6.27**
Girl				0.037 6.41**
Age				0.025 2.32*
Number of siblings				-0.006 2.56*
Log (number of books)				0.022 8.50**
Single parent family				-0.027 3.75**
Parental cultural communication				0.021 5.39**
Parental education effects	No	No	Yes	Yes
Occupational effects	No	No	Yes	Yes
School effects	No	Yes	Yes	Yes
Constant	6.249 878.17**	6.253 7193.46**	6.041 128.01**	5.599 33.76**
Observations	7721	7721	7721	7721
R-squared	0.04	0.24	0.3	0.34

Notes: Robust t statistics in parentheses. * significant at 5%; ** significant at 1%. Regressions are weighted.

Table 5: Modelling the frequency of being helped by a parent

	Ireland		Great Britain	
	Father helps	Mother helps	Father helps	Mother helps
Mother primary teacher	0.118 1.01	0.439 3.85**	0.058 0.6	0.19 1.9
Father primary teacher	0.144 0.52	-0.3 0.88	0.216 1.37	0.214 1.53
Mother secondary teacher	0.011 0.09	0.688 4.46**	0.019 0.15	0.363 2.93**
Father secondary teacher	0.333 1.79	-0.214 1.25	0.058 0.53	0.1 0.62
Mother 3 rd level teacher	0.352 1.04	0.648 2.81**	0.277 1.62	0.449 2.88**
Father 3 rd level teacher	0.163 0.68	0.08 0.38	0.082 0.44	0.051 0.32
Father graduate	0.812 2.52*	-0.144 0.5	1.121 4.00**	0.253 1.23
Mother graduate	-0.644 2.69**	0.36 0.81	-0.219 0.97	0.762 3.03**
Father professional	0.088 0.83	-0.239 2.46*	0.109 1.43	-0.296 3.52**
Mother professional	-0.203 2.78**	-0.198 2.45*	-0.105 1.33	-0.096 1.31
Girl	0.066 1.08	0.146 2.50*	0.035 0.83	0.204 5.45**
Age	-0.366 5.60**	-0.366 5.28**	-0.225 3.63**	-0.332 4.78**
Number of siblings	-0.002 0.12	0.014 0.91	-0.038 2.35*	-0.027 1.61
Log (number of books)	0.044 2.73**	0.03 1.78	0 0.01	0.024 1.51
Single parent family	-0.487 5.83**	-0.15 2.24*	-0.515 8.46**	-0.11 2.13*
Parental cultural communication	0.318 11.8**	0.275 10.24**	0.297 12.17**	0.282 12.99**
Parental education effects	Yes	Yes	Yes	Yes
Occupational effects	Yes	Yes	Yes	Yes
School effects	Yes	Yes	Yes	Yes
Observations	3507	3537	7351	7375

Notes: Robust t statistics in parentheses. * significant at 5%; ** significant at 1%

The dependent variable ranges from 1 to 5 indicating the frequency with which each parent helps the respondent at school, 1 being “hardly ever” and 5 being “several times a week”, see Table 2. Estimation is by maximum-likelihood ordered probit.

References

- Aitchison J. and D.Silvey (1957) "The generalization of probit analysis to the case of multiple responses", *Biometrika* 44: 131-140
- Carlson M.J. and M.E. Corcoran (2001) "Family structure and children's behavioural and cognitive outcomes", *Journal of Marriage and Family*, 63, 779-792
- Chevalier A., K.Denny and D. McMahon (2003) "A Multi-country study of intergenerational educational mobility", UCD Working paper 03/14
- Chevalier A. and P. Dolton (2005) "The labour market for teachers", in S. Machin, A. Vignoles (editors) *What's the good of education? The economics of education in the UK*, Princeton University Press, Princeton NJ.
- Carneiro P. and J.J. Heckman (2003) "Human capital policy" in J. Heckman, A. Krueger, B. M. Friedman (editor) *Inequality in America: what role for human capital policy?* MIT Press, Cambridge, MA.
- Gibbons S. and S. Machin (2003) "Valuing English primary schools", *Journal of Urban Economics*, 53, 197-219
- Greene W.H. (2002) *Econometric Analysis*, 4th ed., Prentice Hall, NJ.
- Heckman J.J. and D.V. Masterov (2005) "Allander series: skill policies for Scotland". NBER working paper 11032
- OECD (2001) *Knowledge and skills for life: first results from PISA 2000*, OECD Paris
- OECD (2002) *Manual for the PISA 2000 Database*. OECD, Paris
- OECD(2003) *Education at a Glance*, OECD, Paris.
- Richards J. G. (1999) "The health and health practices of doctors and their families". *New Zealand Medical Journal* 112(1084) 96-9
- Schnepf, S.V. (2002) "A sorting hat that fails? The transition from primary to secondary school in Germany". Innocenti Working Paper no. 92. Florence: UNICEF Innocenti Research Center.
- Stewart M.B. (2004) "Semi-nonparametric estimation of extended ordered probit models". *Stata Journal* , 4 , 27-39
- Wasserman R. C., Hassuk B. M., Young P. C. and M. L. Land (1989) "Health care of physicians' children". *Pediatrics* 83(3) 319-322