

The socio-economic gradient in educational attainment and labour market outcomes: a cross-national comparison

Jake Anders and John Jerrim

www.jakeanders.uk

www.johnjerrim.com

Institute of Education, University of London

September 2014

Abstract

This paper reviews evidence on the link between family background, educational attainment and labour market outcomes across four rich, English-speaking countries (Australia, Canada, England and the United States). It uses a ‘life-course’ approach, where the magnitude of socio-economic disparities are measured and compared cross-nationally at key transition points. We find that socio-economic inequalities are usually (although not always) smallest in Canada and greatest in the United States. Thus, drawing upon evidence from a collection of independent studies, we find little evidence to support suggestions that the United States is the ‘land of opportunity’, where individuals from humble origins can successfully pursue the ‘American Dream’. Rather, family background matters more to lifetime opportunities in the United States than in other comparable countries.

Contact Details: John Jerrim (J.Jerrim@ioe.ac.uk), Department of Quantitative Social Science, Institute of Education, University of London, 20 Bedford Way London, WC1H 0AL

Acknowledgements: This work has been funded by Jerrim’s ESRC Future Research Leaders grant and the PATHWAYS fellowship scheme (sponsored by the Jacob’s Foundation).

Introduction

In many developed countries, if a child is born into poverty, then they are likely to stay in poverty. This is a consequence of the low and stagnant social mobility that has plagued much of the industrialised world over the last 50 years. Yet many believe that this situation is both economically inefficient and socially unfair. Academics and policymakers across the globe are therefore seeking ways to improve the life-chances of young people from disadvantaged homes. Many believe that improving educational attainment amongst low-income children is key to achieving this goal. This has consequently led to increased interest in quantifying the size of socio-economic gradients in academic achievement, how these compare across countries, and whether these gradients shrink or grow as children age. This chapter reviews the cross-national comparative evidence on this issue, focusing upon four rich English-speaking countries, where this topic has become a key political concern.

The work reviewed in this chapter draws upon Haveman and Wolfe's (1995) framework of the "Determinants of Children's Attainments". A simplified version of this framework is presented in Figure 1.

<<< Figure 1 >>>

There are two key transmission mechanisms driving the link between parental education and young people's educational attainment, and hence their subsequent labour market outcomes. The first mechanism is heredity. This is a direct, biological link across generations, which does not depend upon the way in which parents bring up their children¹. Specifically, it refers to the genetic transfer of skills across generations, such that parents with a genetic predisposition towards academic success are more likely to have children who share this predisposition. With particular relevance to the work reviewed in this chapter, there is little reason to believe that any impact of heredity will vary significantly across countries.

However, Figure 1 also illustrates that children's chances of educational success depend upon a second mechanism: the investments (both financial and non-financial) that parents make in their children. For instance, parents with higher levels of education are more likely to receive a larger income, and hence are able purchase additional educational

¹ More recent medical evidence highlights the importance of gene-environment interaction effects, which suggests that genetic transmission is more complex than we suggest here (see, for instance, Perry 2002 and Turkheimer et al. 2003). Nevertheless, we do not believe it undermines the overall argument of a heritable component of inter-generational transfer of skills.

resources – such as private tutoring or gaining access to a high quality school. In addition, highly educated parents are also much more likely to make non-financial investments in their children, such as visiting museums, eating family meals together or reading bedtime stories. Unlike the case of heredity, it may well be that the effectiveness of these parental investments vary from country to country. For example, purchasing private education in a country with a high quality state school system will obtain less of an advantage than in a country with a lower quality state school system.

Such a model poses a challenge for work that seeks to examine the effect of family background upon children's outcomes. To see why, imagine a society with complete equality of opportunity, defined as there being no causal effect of a family's resources on their children's outcomes. However, there would still be an effect of parental ability on child attainment, via hereditary transmission processes. Furthermore, parental ability would remain correlated with family resources. It follows that one would still find a correlation between parental socio-economic status and children's outcomes.

This implies that, without a comparative context, simple associations between parents' socio-economic status and children's outcomes tell us little about the extent to which children's test scores are attributable to the environments in which they have been brought up. A cross-national comparative approach is one way of attempting to provide context for the observed correlations (Beller 2009; Blanden 2013). By comparing the strength of intergenerational relationships in different countries, one can identify the societies "in which disadvantaged children do not receive the inputs they need to succeed" (Jerrim 2012)².

The aim of this chapter is to present such cross-national comparative evidence for four rich English-speaking countries (Australia, England, Canada and the United States), focusing upon the link between family background (typically measured using parental education) and offspring's educational attainment and labour market outcomes. These nations share a number of cultural similarities, including language and political systems, while also

² This approach also provides potential pointers to how we might reduce these inequalities, by comparing the institutional differences between such countries. However, we should note that the term 'institutions' must be interpreted quite broadly for findings to be interpreted in the ways discussed above. They refer not just to the formal institutions, such as ways in which schooling systems are organised, but also to informal institutions, such as income inequality (Jerrim and Macmillan, 2014) and attitudes among parents, teachers, employers, and society at large.

having important economic and historical ties. Yet these countries also differ in terms of the educational, social and labour market opportunities they offer to young people from disadvantaged homes. For instance, leading economists have argued that, despite their broadly similar levels of income inequality, Canada and Australia are more socially mobile than England and the United States (Blanden 2013). A small but growing literature is now trying to explain why this is the case.

We review this literature throughout this chapter, explicitly comparing socio-economic achievement gradients across these four countries, while also putting them into the context of a broader set of developed nations where possible. A major challenge is that we need to be sure that variation across countries is not driven by differences in measurement. Until relatively recently, this was difficult to achieve, with research having to rely on different administrative data or survey instruments from different countries. The spread of cross-national comparative datasets, such as the Programme for International Student Assessment (PISA), Trends in International Mathematics and Science Study (TIMSS), and Programme for International Assessment of Adult Competencies (PIAAC) has improved the scope for work of this kind. The research reviewed in this chapter makes use of such datasets where possible. However, as we take a ‘life-course’ approach, reviewing the magnitude of socio-economic inequalities at a number of key life-points, there are instances where evidence using such international comparative datasets are not available. On these occasions, we draw upon evidence that has harmonised a set of existing national specific datasets ex-post (i.e. after data collection). In doing so, this chapter seeks to establish whether any broad generalisations can be made about the extent of socio-economic inequalities across the four countries of interest. For instance, are socio-economic gaps bigger in the United States than the other three countries, and does this hold true at all points throughout the life-course?

Pre-school

Socio-economic differences in children’s educational investments begin in-utero (e.g. quality of pre-natal care) and continue during their first years of life (e.g. reading and interaction with the child). Thus large parental education differences in cognitive and social skills emerge even before children begin formal schooling. However, is there cross-national variation in these socio-economic gradients at such an early age? Bradbury et al (2012) present evidence on this issue for Australia, Canada, the United Kingdom and the United States. Figure 2 Panel A illustrates differences in vocabulary skills when children were aged

approximately four or five. Parental education is defined in three groups: low (below high school), medium (high school to some college) and high (bachelor degree and higher). Medium parental education is the reference category, with the white (grey) segment of the bars illustrating differences relative to the low (high) groups.

<< **Figure 2** >>

In the United States, children from a high parental education background score (on average) 1.2 standard deviations higher on the vocabulary test than their peers from low parental education backgrounds. This is significantly larger than in any of the three other countries considered. The analogous difference is 0.97 standard deviations in the United Kingdom and 0.85 in Australia. However, the smallest difference is found in Canada (0.66 standard deviations), where the parental education gradient is almost half the size of that found in the United States. Yet it is interesting to note that Bradbury et al (2012) also find that this cross-national variation is greatly reduced once race, ethnicity and immigrant status are controlled. Specifically, the parental education gap in vocabulary skills falls to around 0.87 in the United Kingdom and United States, remains stable at 0.83 in Australia and increases slightly in Canada (0.71). This suggests that the interplay between ethnicity and social disadvantage is a major factor driving the cross-national variation observed in Figure Panel A.

Do similarly large parental education differences exist in terms of children's social skills? And does the magnitude of these differences vary across countries? Bradbury et al (2012) present cross-sectional evidence on this issue when children are age four or five using a set of national specific longitudinal datasets. Specifically, they illustrate differences in 'externalising behaviour problems' (using items from the Strengths and Difficulties Questionnaire) by parental education group. Key findings from this analysis are presented in Figure 2 Panel B.

Parental education differences in infants' socio-emotional skills are greatest in the United Kingdom, standing at 0.80 standard deviations between the low and high parental education groups. This is a somewhat stronger association than found in Australia and the United States (0.64 standard deviations). Further inspection of Figure 2 suggests that this cross-national variation is being driven by differences between the low and middle parental education groups (approximately 0.50 standard deviations in the United Kingdom compared to 0.3 in Australia and the United States). However, it is Canada that really stands out. There

is just a 0.24 standard deviation difference in behaviour problems between the top and bottom education groups, with the low-middle parental education gap not reaching statistical significance at conventional thresholds. Moreover, in contrast to the results for vocabulary skills, the same broad cross-national pattern continues to hold even after race, ethnicity and nativity have been controlled.

Primary school

The previous section illustrated that there are substantial differences in children's outcomes by parental education group even before compulsory schooling has begun. Furthermore, the extent of these differences is noticeably larger in some countries than others. Perhaps this is understandable, since pre-school provision may vary significantly depending upon parents' education. As such, one might hope that children's years in free, universal primary education would narrow educational inequalities, or at least would not widen them.

Using longitudinal data from the United States (Early Childhood Longitudinal Study Kindergarten Cohort) and England (Avon Longitudinal Survey of Parents and Children), Magnuson et al (2012) explore parental education differences in educational achievement and how these change during primary school (treated here as between ages 5 and 11)³. They analyse "scaled" and "standardised" measures of children's achievement in reading and maths over this period. Both metrics have their strengths and limitations. Standardised scores allow us to assess inequalities in terms of *relative* differences between advantaged and disadvantaged groups across countries and over time, even when no directly comparable measures of achievement are available. However, by standardising scores, one is unable to capture the likely increase in the dispersion of skills that occurs as children age. On the other hand, scaled scores have the ability to capture changes in real skills over time, including any increase in dispersion. The disadvantage, however, is that unless they have been explicitly designed to be comparable across countries and over time (e.g. PISA scores), then they cannot be used when conducting cross-country or cross-cohort comparisons.

Figure 3 illustrates how the link between parental education and children's reading test scores changes over time in England and the United States, drawing upon the study by

³ Patterns of educational inequality in primary school are not reviewed for Australia and Canada. At the time of writing, there is no cross-nationally comparable evidence available including these countries (as well as the United Kingdom and the United States).

Magnusson et al⁴. The left-hand panel considers changes in standardised scores. The results at early ages confirm our findings from the previous section: young people’s performance is already highly socially graded by approximately age five. In England, those whose parents have the highest education levels perform one standard deviation higher than their peers whose parents have low levels of education. The gap is slightly wider in the United States than in England, with children whose parents have the highest education levels performing 1.2 standard deviations better than their peers whose parents have low levels of education.

<< Figure 3 >>

Our primary interest here is how these social gradients in academic achievement evolve during primary school. The results do not differ much between England and the United States. The relative difference between the high and low parental education groups narrows slightly (to approximately 1.1 standard deviations) in the United States between ages 5 and 7, before widening again between ages 7 and 11. Overall, the gap remains roughly constant over the period. In England, the gap grows slightly between ages 5 and 11, reaching approximately 1.2 standard deviations by the end of primary school. However, overall, the change in the *relative* difference between high and low parental education groups over this period is small, and within the bounds of sampling variation.

Figure 3 Panel B turns to the analysis of “scaled” scores. This suggests that, although the *relative* test score gap between high and low parental education groups remains stable during primary school, the average difference in their absolute level of skill grows. This is shown on the graph through the widening gaps over time between the lines representing the average performance of children whose parents have each level of education. Taking the case of reading skills in the United States, the parental education gradient in scaled scores grows from around 10 points at age 5 to around 30 points at age 11 (despite standardised scores remaining constant). This is being driven by the increase in the dispersion of skill (and thus scaled scores) as children age.

Secondary school

The previous section illustrated that there are large socio-economic differences in educational attainment even before children enter secondary school. Yet socio-economic inequalities may

⁴ Magnusson et al also present evidence on maths test scores, though these are similar to those for reading, and so not presented here for brevity.

be exacerbated during secondary education, particularly in countries where there are high levels of between school segregation (Hanushek and Woessmann 2006). Indeed, returning to the Haveman and Wolfe (1995) framework presented in Figure 1, school quality may be considered one of the major differences in ‘educational investments’ made by socio-economically advantaged and disadvantaged groups.

Jenkins, Micklewright and Schnepf (2008) use the 2000 and 2003 rounds of the Programme for International Student Assessment (PISA) to illustrate the extent to which pupils from different social backgrounds are found within different schools. Their key findings are presented in Figure 4, with greater values of the dissimilarity index (D) representing more between school segregation.

<< Figure 4 >>

Between school segregation is very similar in Australia ($D \approx 0.33$) and Canada ($D \approx 0.32$) and is not significantly different to the cross-country median ($D \approx 0.35$). The United Kingdom is divided into its constituent countries, with segregation notably higher in England and Wales ($D \approx 0.37$) and Northern Ireland ($D \approx 0.35$) than in Scotland ($D \approx 0.27$). However, perhaps the most striking feature of Figure 4 is that the United States has medium-to-low levels of school segregation ($D \approx 0.32$), despite evidence that it has a particularly large socio-economic gradient in educational achievement (further details provided below).

How big are social class gaps in educational achievement as children reach the latter stages of secondary school? Jerrim (2012) presents evidence on this issue, comparing PISA reading test scores between 15 year olds from “advantaged” and “disadvantaged” backgrounds. (Note that advantage/disadvantage is defined in this study as pupils whose parents hold an occupation in the top/bottom national quintile of the International Socio-Economic Index – see Ganzeboom et al 1992). These results are presented in Figure 5.

<< Figure 5 >>

Of the 23 countries considered, the United States has the third largest socio-economic achievement gradient, standing at 1.1 international standard deviations (equal to approximately 2 years and 9 months of schooling). England and Australia are around the middle of this international ranking, with disadvantaged children around 0.9 standard deviations (2 years and 3 months) behind their more advantaged peers. Yet the test score gap is somewhat smaller in Canada, standing at just 0.7 standard deviations (1 year and 9

months). Hence the difference between advantaged and disadvantaged pupils' performance is one whole school year bigger in the United States than in neighbouring Canada.

An interesting feature of Jerrim's (2012) work is that it not only considers differences in test scores between children from advantaged and disadvantaged backgrounds *on average*, but also differences between the highest and lowest achievers across socio-economic groups. These findings are summarised in Table 1.

<< Table 1 >>

In the United States, the “smartest” (highest achieving) children from disadvantaged backgrounds are approximately 2.5 school years behind the “smartest” (highest achieving) children from affluent backgrounds. This difference is bigger than in almost every other country considered (the exceptions being Scotland, New Zealand and Israel). A similarly large gap exists in Australia (2 years and 2 months of schooling) and England (2 years and 5 months of schooling) but is again notably smaller in Canada (just 1.4 years of schooling). This finding is particularly alarming from a social equality perspective. It illustrates how, in countries like England and the United States, even the highest achieving children from disadvantaged backgrounds lag substantially behind their more advantaged peers.

Post-secondary education

Attending Higher Education (HE) potentially has large effects on young people's future labour market outcomes. As such, socio-economic differences in access to university may be an important driver of later inequalities. However, cross-national comparisons in this area poses additional challenges compared to in-school inequalities. While universal secondary education is common across our four countries of interest, there is much more variation in their tertiary sectors. Some key differences are highlighted in Table 2.

<<< Table 2 >>>

With such different systems, one might expect there to be substantial differences in access to higher education across these countries. Jerrim and Vignoles (2014) consider this issue, with their key findings presented in Figure 6. This illustrates the difference in the log-odds of starting a bachelor's degree for children whose parents have high levels of education (above the axis) or low levels of education (below the axis), relative to those with average

levels of education. The greater the height of the vertical bars, the greater the inequality in access.

<<< **Figure 6** >>>

There are substantial socio-economic gaps in access to university across all four countries, with young people with highly educated parents having four times the odds of enrolling in a bachelor's degree than the "average" parental education group. However, there is some cross-country variation in these figures, with the parental education gradient being slightly larger in England and Canada, and somewhat smaller in Australia. Perhaps surprisingly, it is *not* the United States where the link between parental education and university access is greatest (despite private costs of attending university in this country being particularly high).

However, part of this link between parental education and university access may be explained by differences in achievement that have already emerged by the end of secondary schooling (documented in the previous section). Jerrim and Vignoles therefore re-run the above analysis, controlling for a range of cognitive test scores and school grades up to age 18. Figure 7 thus illustrates differences in university access by parental education group amongst young people with the same level of performance at the end of secondary school.

<<< **Figure 7** >>>

Unsurprisingly, in all four countries, prior attainment is found to be a key determinant of young people's chances of entering university. Moreover, as prior attainment is highly socially graded, differences in university access by parental education group are dramatically reduced. This supports the view that a key driver of inequality in access to higher education is inequality in outcomes before the point of entry (Anders 2012; Chowdry et al. 2013). Most strikingly, differences between the low and average parental education groups is almost entirely explained by prior achievement in three of the four countries (Canada is the exception).

Jerrim and Vignoles (2014) also find that, after conditioning on parental education and prior attainment, low parental income is no longer a statistically significant predictor of enrolment into a bachelor's degree in any of the four countries. This concords with previous evidence that it is longer-run indicators of socio-economic status, rather than short-run

resources at the time of entry, that seem to influence university participation (Carniero and Heckman 2002; Dearden, McGranahan and Sianesi 2004)⁵.

Access to ‘elite’ universities potentially offer greater economic rewards than those from other, lower status institutions. Yet there may also be different barriers to entry (Pallais and Turner 2007). Jerrim and Vignoles (2014) illustrate that the link between parental education and access to such ‘elite’ institutions is larger than that for entry into higher education more generally, and this holds true in each of the four countries considered. While these gradients are substantially reduced once academic achievement in secondary school has been taken into account, Jerrim and Vignoles (2014) continue to find that “children from high parental education backgrounds are a further eight percentage points more likely to attend a selective institution”. Similar results emerge for Jerrim, Chmielewski and Parker (2014) who argue that, given the very high levels in inequality found across rather different higher education systems, radical changes may be needed if such “effectively maintained inequality” is to be overcome.

One might expect that particularly high levels of educational inequality towards the top of the attainment distribution would be a prominent reason for inequality in access to post-secondary education, particularly access to ‘elite’ institutions. This would imply that socio-economic gradients in access to tertiary education should be greater in countries like England and the United States (where the link between family background and achievement in secondary school are strong) than in countries like Canada (where the link between family background and achievement in secondary school is comparatively weak). However, the evidence reviewed in this section suggests this is *not* the case; surprisingly, the particularly strong association between family background and PISA test scores in England and the United States (documented in the previous section) is not replicated when it comes to university access (including entry into elite post-secondary institutions).

Adult skills

Of course, education does not end after post-secondary schooling. Skills are both developed and maintained within the labour market, and through adult education. It is therefore important also to consider socio-economic inequality in long-run educational outcomes, such

⁵ However, it should be noted that, for England at least, measures of family resources that attempt to get closer to ‘permanent’ rather than ‘transitory’ family income remain significantly associated with HE attendance, conditional on parental education and prior attainment (Anders 2012).

as cognitive skills within the adult population. Jerrim and Macmillan (2014: Table 4) present such evidence using the cross-nationally comparable Programme for International Assessment of Adult Competencies (PIAAC) dataset. Figures from this paper are reproduced in Table 3. These refer to differences in numeracy test scores between men aged 25 to 59 from low (high school or less) and high (bachelor degree and higher) backgrounds.

<< Table 3 >>

In every country, there is a strong and statistically significant association between parental education and the numeracy skills of adults. However, there is also evidence of cross-national variation. Socio-economic inequality in adult skills is particularly strong in the United States and the United Kingdom, where men from a low parental education background obtain a PIAAC numeracy score more than one standard deviation below their peers from high parental education backgrounds. Figures for Canada (0.78) and Australia (0.66) are much smaller, suggesting that the United States and the United Kingdom are particularly unequal in terms of the long-run development and maintenance of important labour market skills. Some caution is required, however, when interpreting this finding due to the large standard errors (and thus uncertainty) due to sampling variation.

Labour market outcomes

Whereas the previous sections have focused upon social gradients in educational attainment, Jerrim (2014) and Jerrim and Macmillan (2014) use the OECD Programme for International Assessment of Adult Competencies (PIAAC) dataset to examine the link between parental education and labour market outcomes. The vertical axis of Figure 8 plots the difference in (log) earnings between individuals from ‘high’ (bachelor degree) and ‘low’ (high school only) parental education backgrounds. A measure of income inequality (the Gini coefficient) is presented along the horizontal axis, with a regression line illustrating the relationship between the two. Australia (square), Canada (circle), England (diamond) and the United States (triangle) are highlighted.

<< Figure 8 >>

A number of interesting features stand out. First, there is a strong relationship between income inequality and intergenerational mobility, with the correlation coefficient standing at approximately 0.85. This has become known as the ‘Great Gatsby Curve’ in the academic literature, and is thought to be *‘the outcome of a whole host of ways that inequality*

of incomes affects children' (Corak 2013:7). Second, income inequality (x-axis) is slightly lower in Australia and Canada than in England, while the United States stands out as being particularly economically unequal. Third, in all four countries, individuals from low parental education backgrounds earn substantially less than their peers whose parents hold at least a bachelor's degree. Yet the magnitude of this social gradient differs substantially by country. For instance, the high-low parental education earnings gap is approximately 25 percent in Canada and Australia, compared to around 40 percent in the United Kingdom and almost 60 percent in the United States. Australia and Canada can thus be characterised as having moderate levels of both income inequality and intergenerational mobility by international standards. In contrast, the United Kingdom and (particularly) the United States are countries with comparatively high levels of income inequality and low levels of social mobility.

The Haveman and Wolfe (1995) framework presented in Figure 1 suggested that educational attainment is one of the most important factors mediating this link between parental education and the labour market outcomes of offspring. Jerrim and Macmillan (2014) investigate this proposition using the PIAAC data. Specifically, they decompose the relationship between parental education and offspring earnings into two components: the part that works through the educational attainment of offspring ('through education') and the part that does not ('not through education'). A summary of their key findings can be found in Figure 9. The length of the bars illustrate the 'total' association between parental education and their offsprings' earnings. The grey portion then illustrates the magnitude of the 'through education' effect.

<< Figure 9 >>

Education is clearly an important driver in the intergenerational transmission of (dis)advantage. In most countries, the association between parental education and offspring earnings is reduced by approximately three-quarters once educational attainment has been controlled. However, there is also notable cross-country variation. In the Scandinavian and (heavily tracked) Central European countries (Austria, Germany, Belgium and the Netherlands), once educational attainment has been controlled for there is essentially no link between parental education and offspring earnings. On the other hand, a seven percent earnings gap remains between high and low parental education groups in Australia and Canada, 13 percent in the United States and 18 percent in the United Kingdom. Indeed, only around half of the total intergenerational association can be explained by educational

attainment in the United Kingdom, compared to approximately 70 to 75 percent in Australia, Canada and the United States. The United Kingdom therefore stands out as a country where factors other than educational attainment have a particularly prominent role in driving its comparatively low levels of social mobility (at least within the PIAAC dataset and with mobility defined in this particular way).

Conclusions

Understanding the relationship between family background, educational attainment and, ultimately, labour market outcomes is of crucial importance to developing effective policies to break the link between a disadvantaged upbringing and disadvantage in later life. This paper has reviewed evidence on this issue using a cross-national comparative life-course approach. Specifically, we have documented the strength of the association between family background and educational outcomes across four rich, English-speaking countries (Australia, England, Canada and the United States) at a number of key points in young people's lives.

Table 4 provides a summary of our results. It is immediately apparent that socio-economic inequalities are large in all four countries, and that this holds true at all points throughout the life course. Yet there is also evidence of cross-national variation in the magnitude of these gaps, suggesting that some countries are more successful in equalising opportunities across social groups than others. For instance, the first row of Table 4 illustrates that parental education gaps in vocabulary and socio-emotional skills are large even when children are young, though to a somewhat lesser extent in Canada than in the United States. When in primary school, socio-economic gaps in reading and maths tests scores in the United Kingdom and the United States are equally as large (around 1.2 standard deviations) – with there being some evidence that the skill differential grows in absolute (though not relative) terms. Yet, despite similar levels of school segregation, the United States stands out once more as having a particularly strong relationship between family background and children's test scores towards the end of secondary education (with this association being significantly weaker in Canada than the other three countries).

<< Table 4 >>

Somewhat surprisingly, the same pattern does not hold for post-secondary education, with Table 4 suggesting Australia is the most equal, Canada the least equal, with the United

Kingdom and United States sat in-between the two. However, a familiar pattern returns at the bottom of Table 4, where we see that individuals from low parental education backgrounds in the United States earn 75 percent less than their peers from high parental education backgrounds. This is notably bigger than in countries like Canada and Australia, where the analogous earnings differential is little more than 25 percent. A similar cross-country pattern holds for parental education differences in adult numeracy skills. Overall, we thus find that the link between family background and later outcomes tends to be strongest in the United States and weakest in Canada, with Australia and the United Kingdom generally falling between the two. This is clearly at odds with the notion that the United States is the ‘land of opportunity’, where individuals from humble origins can successfully pursue the ‘American Dream’.

What do these findings imply for public policy? Returning to the Haveman and Wolfe (1995) framework presented in Figure 1, the existence of hereditary factors means that socio-economic gaps in educational attainment and labour market outcomes are unlikely ever to be eradicated completely. However, the weaker influence of socio-economic status in culturally similar countries suggests that there may be scope to narrow the particularly large inequalities currently observed in the United States (and, to a certain extent, the United Kingdom as well).

How might this be achieved? Other work, particularly in Economics, has highlighted the high returns to investments made in the early years (Cunha et al., 2006). Yet pre-eminent Sociologists continue to stress the importance of “secondary effects”, and that cost-effective interventions can assist disadvantaged youth through difficult transitions (such as into Higher Education) in the late teenage years (Jackson et al 2007; Jackson 2013). The reality, in our view, is that a combination of both approaches is needed, where a prolonged series of investments are made in children from disadvantaged backgrounds, starting at birth and continuing through to university graduation (and possibly beyond). Such an approach is, of course, unlikely to be cheap. But, just as we have used a ‘lifecourse approach’ to understand the magnitude of socio-economic inequalities, policymakers may need to do the same if they are to succeed in reducing them.

References

- Anders, J. 2012. "The link between household income, university applications and university attendance." *Fiscal Studies* 33(2): 185-210.
- Beller, E. 2009. "Bringing intergenerational social mobility research into the twenty-first century: why mothers matter." *American Sociological Review* 74(4): 507–28.
- Blanden, J. 2013. "Cross-national rankings of intergenerational mobility: A comparison of approaches from economics and sociology." *Journal of Economic Surveys* 27(1):38–73.
- Bradbury, B., Corak, M., Waldfogel, J. and Washbrook, E. 2012. "Inequality in early childhood outcomes." Pp. 87 - 119 in *Inequality from Childhood to Adulthood: A Cross-National Perspective on the Transmission of Advantage* edited by John Ermisch, Markus Jäntti and Timothy Smeeding. New York: Russell Sage Foundation.
- Carneiro, P. and Heckman, J. 2002. "The evidence on credit constraints in post-secondary schooling." *The Economic Journal* 112(482):705–734.
- Chowdry, H., Crawford, C., Dearden, L., Goodman, A. and Vignoles, A. 2012. "Widening participation in higher education: analysis using linked administrative data." *Journal of the Royal Statistical Society Series A* 176(2): 431-57.
- Corak, M. 2013. "Income equality, equality of opportunity, and intergenerational mobility." *Journal of Economic Perspectives* 27(3): 79 – 102.
- Cunha, F., Heckman, J. J., Lochner, L., & Masterov, D. V. 2006. "Interpreting the evidence on life cycle skill formation". In E. Hanushek & F. Welch (eds), *Handbook of the Economics of Education (Vol. Volume 1, pp. 697-812)*, Philadelphia: Elsevier.
- Dearden, L., McGranahan, L. and Sianesi, B. 2004. "The role of credit constraints in educational choices: evidence from NCDS and BCS70". *CEE Discussion Paper*. Accessed 12/07/2014 from <http://cee.lse.ac.uk/ceedps/ceedp48.pdf>.
- Ganzeboom, H., De Graaf, P. and Treiman, D. 1992. "A standard international socio-economic index of occupational status." *Social Science Research* 21(1): 1 – 56.
- Hanushek, E. and Woessmann, L. 2006. "Does educational tracking affect performance and inequality? Differences-in-differences evidence across countries." *Economic Journal* 116(510): C63-C76.
- Haveman, R. and Wolfe, B. 1995. "The determinants of children's attainments: a review of methods and findings." *Journal of Economic Literature* 33(4): 1829-1878.
- Jackson, M., Erikson, R., Goldthorpe, J. and Yaish, M. 2007. "Primary and Secondary Effects in Class Differentials in Educational Attainment." *Acta Sociologica* 50(3):211-29.
- Jackson, M. 2013. *Determined to Succeed Performance versus Choice in Educational Attainment*. Stanford: Stanford University Press.

Jenkins, S., Schnepf, S. and Micklewright, J. 2008. "Social segregation in secondary schools: how does England compare with other countries?" *Oxford Review of Education* 34(1): 21-37.

Jerrim, J. 2012. "The socio-economic gradient in teenagers' literacy skills: how does England compare to other countries?" *Fiscal Studies* 33(2):159-84.

Jerrim, J., Chmielewski, K. and Parker, P. 2014. "Socioeconomic inequality in access to high-status colleges: a cross-country comparison of primary and secondary effects." Unpublished manuscript.

Jerrim, J. and Vignoles, A. 2014. "University access for disadvantaged children: A comparison across English speaking countries." DoQSS working paper 12/11. Accessed 12/07/2014 from <http://ideas.repec.org/p/qss/dqsswp/1211.html>.

Jerrim, J. 2014. "The link between family background and later lifetime income: how does the United Kingdom compare to other countries?" DoQSS working paper 14/02. Accessed 12/07/2014 from <http://ideas.repec.org/p/qss/dqsswp/1402.html>.

Jerrim, J. and Lindsey Macmillan. 2014. "Income inequality, intergenerational mobility and the Great Gatsby Curve: is education the key?" Unpublished manuscript.

Magnuson, K., Waldfogel, J. and Washbrook, E. 2012. "The development of SES gradients in skills during the school years: evidence from the U.S. and U.K." In John Ermisch, Markus Jantti and Timothy Smeeding (eds) *Inequality from Childhood to Adulthood: A Cross-National Perspective on the Transmission of Advantage*, New York: Russell Sage Foundation.

OECD. 2010. "PISA 2009 results. Learning to learn: student engagement strategies and practices." Paris: OECD.

Pallais, A. and Turner, S. 2006. "Opportunities for low-income students at top colleges and universities: policy initiatives and the distribution of students." *National Tax Journal* 59(2): 357-86.

Perry, B. 2002. "Childhood experience and the expression of genetic potential: what childhood neglect tells us about nature and nurture." *Brain and Mind* 3: 79-100.

Turkheimer, E., Haley, A., Waldron, M., D'Onofrio, B. and Gottesman, I. 2003. "Socioeconomic status modifies heritability of IQ in young children." *Psychological Science* 14(6): 623-628.

Table 1. Differences in PISA reading test scores between the most and least able pupils from ‘advantaged’ and ‘disadvantaged’ homes

	Lowest achievers		Highest achievers	
	Years of schooling gap	SE	Years of schooling gap	SE
Finland	1.48	0.25	0.99	0.17
Iceland	1.33	0.28	1.29	0.25
Germany	2.72	0.22	1.35	0.20
Canada	1.89	0.16	1.38	0.18
Germany	2.16	0.21	1.45	0.17
Spain	2.45	0.18	1.57	0.09
Turkey	1.68	0.32	1.62	0.22
Ireland	2.20	0.33	1.63	0.25
Austria	2.47	0.30	1.68	0.22
Switzerland	2.16	0.28	1.73	0.21
Luxemburg	2.33	0.52	1.73	0.48
Netherlands	1.70	0.25	1.74	0.29
Mexico	1.93	0.14	1.75	0.10
Estonia	1.82	0.29	1.76	0.21
Greece	2.59	0.30	1.76	0.22
Italy	2.19	0.19	1.81	0.12
Norway	1.83	0.19	1.84	0.14
Sweden	2.28	0.32	1.89	0.25
Portugal	2.82	0.23	1.93	0.18
Poland	2.36	0.23	2.00	0.15
Slovak Republic	2.34	0.27	2.01	0.21
Slovenia	2.37	0.20	2.03	0.13
Belgium	3.30	0.25	2.09	0.19
Hungary	3.08	0.24	2.15	0.14
Australia	2.41	0.19	2.15	0.14
France	2.93	0.30	2.18	0.21
Czech Republic	2.58	0.24	2.29	0.11
Chile	1.98	0.21	2.34	0.19
England	2.17	0.22	2.41	0.19
USA	2.63	0.36	2.47	0.18
New Zealand	3.10	0.33	2.60	0.25
Scotland	2.37	0.21	2.64	0.20
Israel	2.34	0.34	2.91	0.21

Notes: Figures refer to the difference in the 90th percentile of the reading test scores between children from ‘advantaged’ and ‘disadvantaged’ backgrounds. This has then been scaled into a years of schooling metric, with 40 PISA points equivalent to approximately one school year (OECD 2010: 110). Source = Jerrim (2011: Table 4) and unpublished results.

Table 2. Differences in Higher Education institutions by country

	US	England	Canada	Australia
Educational expenditure				
% of GDP spent on tertiary education	1.3	0.8	1.8	1.1
Bachelor's degree Enrolment				
% of pop. starting bachelor's degree by age 20	45	37	43	39
% of pop. obtaining bachelor's degree (all ages)	50	48	36	38
Non-completion rate (% of entrants)	44	21	25	28
% of enrolments by foreign students	3	18	7	22
% tertiary students rolled in private universities	32	0	0	3
University tuition fees				
Avg. annual tuition fees public institutions (\$US)	6,312	4,731	3,774	4,222
Avg. annual tuition fees <i>private</i> institutions (\$US)	22,852	-	-	9,112
Avg. tuition fee all students (\$US)	11,605	4,731	3,774	4,369
Avg. length of bachelor's degree course (years)	4	3	3 to 4	3 to 4
Tuition cost of a bachelor's degree (\$US)	46,419	14,193	15,096	17,475
University scholarships				
% of pupils receiving grant / scholarship	65	58	-	8
% of pupils receiving public loans	50	87	-	81
% NOT receiving loan, scholarship or grant	24	6	-	19

Notes: Tuition fee figures to England refer to pre-2012, which is the relevant time period for the analysis. Source = Jerrim and Vignoles (2014: Table 1).

Table 3. Differences in PIAAC test scores between individuals from low and high parental education backgrounds

	Effect size	Standard error
United States (US)	1.27	0.47
Slovak Republic (SK)	1.14	0.42
United Kingdom (UK)	1.10	0.41
Poland (PL)	1.04	0.39
Germany (DE)	0.98	0.38
France (FR)	0.90	0.33
Italy (IT)	0.86	0.33
Spain (ES)	0.80	0.30
Ireland (IE)	0.78	0.28
Canada (CA)	0.78	0.29
Cyprus (CY)	0.77	0.30
Austria (AT)	0.73	0.28
Belgium (BE)	0.72	0.27
Norway (NO)	0.69	0.25
Australia (AU)	0.66	0.25
Finland (FI)	0.66	0.25
Denmark (DK)	0.63	0.24
Czech Republic (CZ)	0.61	0.28
Estonia (EE)	0.59	0.22
Sweden (SE)	0.58	0.22
Netherlands (NL)	0.57	0.22
Japan (JP)	0.50	0.20
Korea (KR)	0.50	0.19
Russia (RU)	0.30	0.14

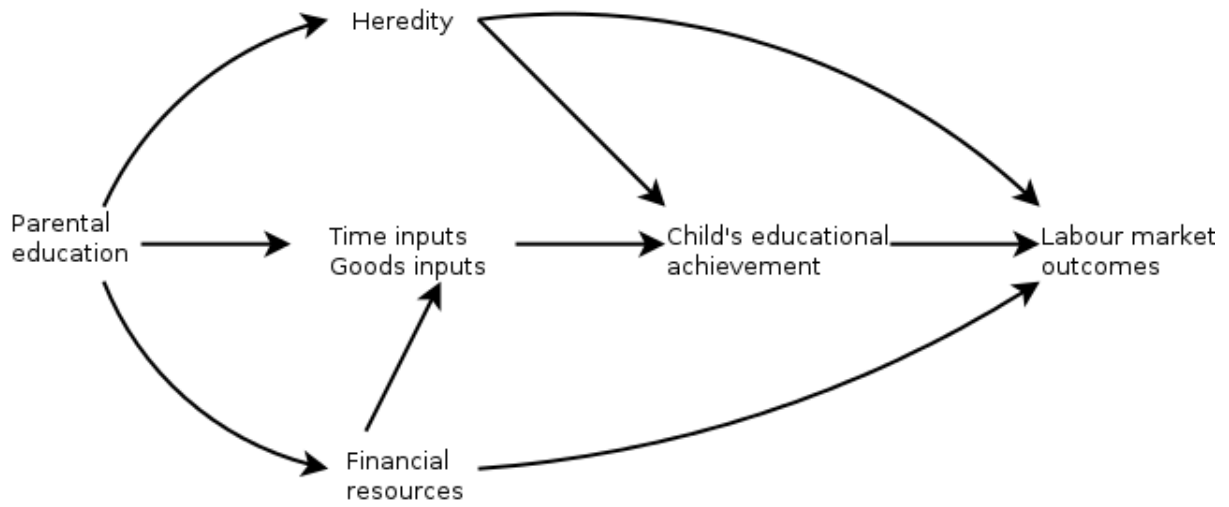
Notes: Countries identified by their two letter country codes. Source = Jerrim and Macmillan (2014: Table 4).

Table 4. A summary of social gradients in educational attainment and labour market outcomes across Australia, Canada, the United Kingdom and the United States

	Outcome unit	SES	Australia	Canada	UK	US
Pre-school						
Vocabulary skills	Effect size	ED	0.85	0.66	0.97	1.21
Socio-emotional skills	Effect size	ED	0.64	0.24	0.80	0.64
Primary school						
Reading skills	Effect size	ED	-	-	1.18	1.21
Maths skills	Effect size	ED	-	-	1.18	1.14
Secondary school						
Segregation	Dissimilarity index	OCC	0.33	0.32	0.37	0.32
PISA reading (average)	Effect size	OCC	0.92	0.67	0.93	1.06
PISA reading (high achievers)	Effect size	OCC	0.86	0.55	0.96	0.99
Higher education						
Access to university	Odds ratio	ED	4.5	12.6	10.6	9.0
Access to elite university	Odds ratio	ED	5.8	10.3	11.8	16.4
Adult skills						
PIAAC test scores	Effect size	ED	0.66	0.78	1.10	1.27
Labour market outcomes						
Earnings gap (unconditional)	% difference	ED	28	25	51	75
Earnings (controlling for ed)	% difference	ED	7	7	20	14

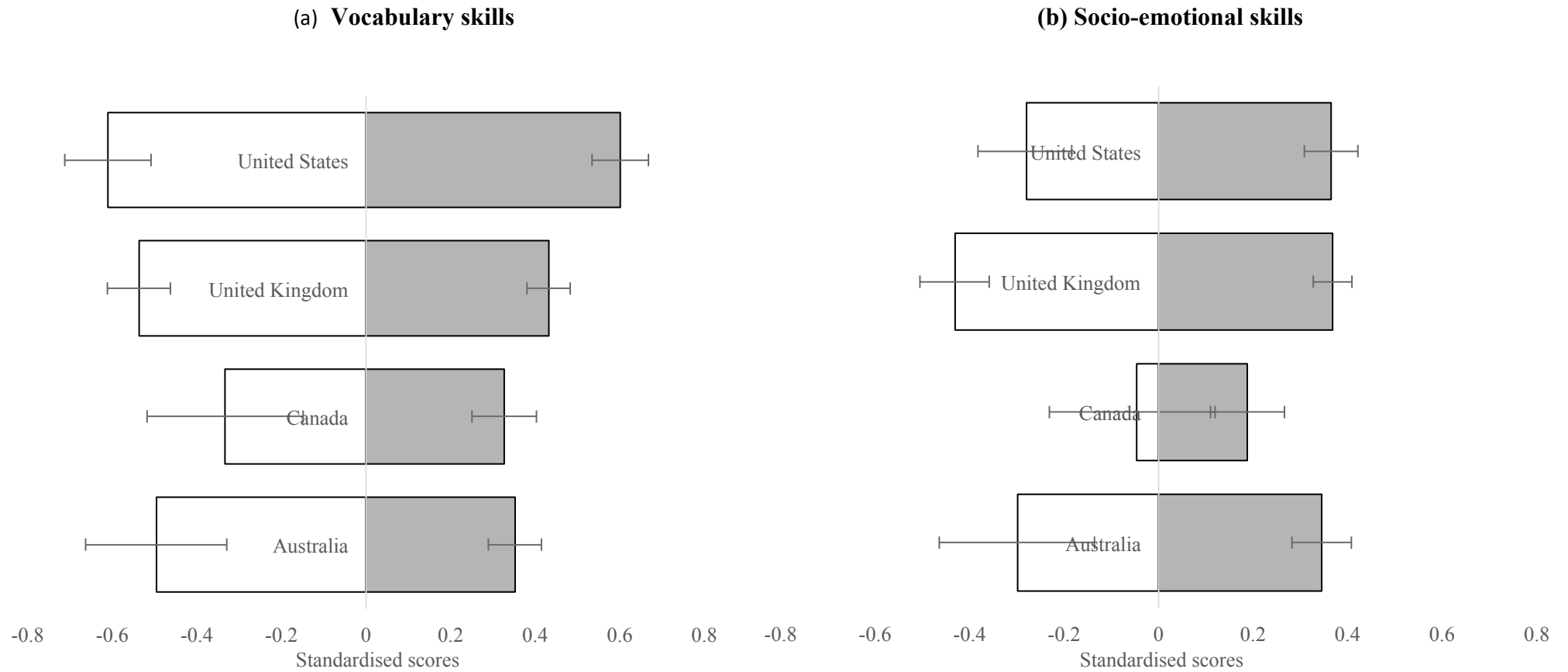
Notes: Estimates drawn from various sources cited through this paper. ‘SES’ column refers to the measure of socio-economic status that has been used (‘ED’ indicates parental education and ‘OCC’ indicates parental occupation).

Figure 1. Simplified framework of Home Investments in Children



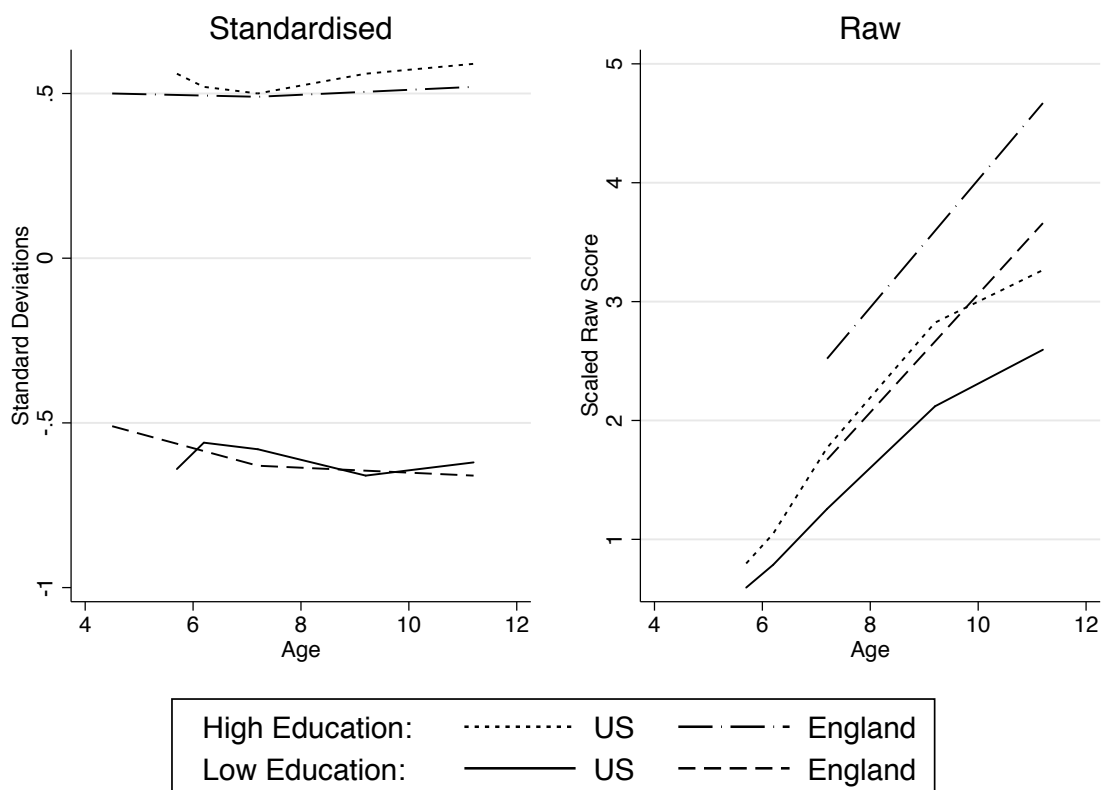
Notes: Adapted from Haveman and Wolfe (1995: Figure 1).

Figure 2. Differences in vocabulary and socio-emotional skills by age 4/5 by parental education group: A cross-country comparison



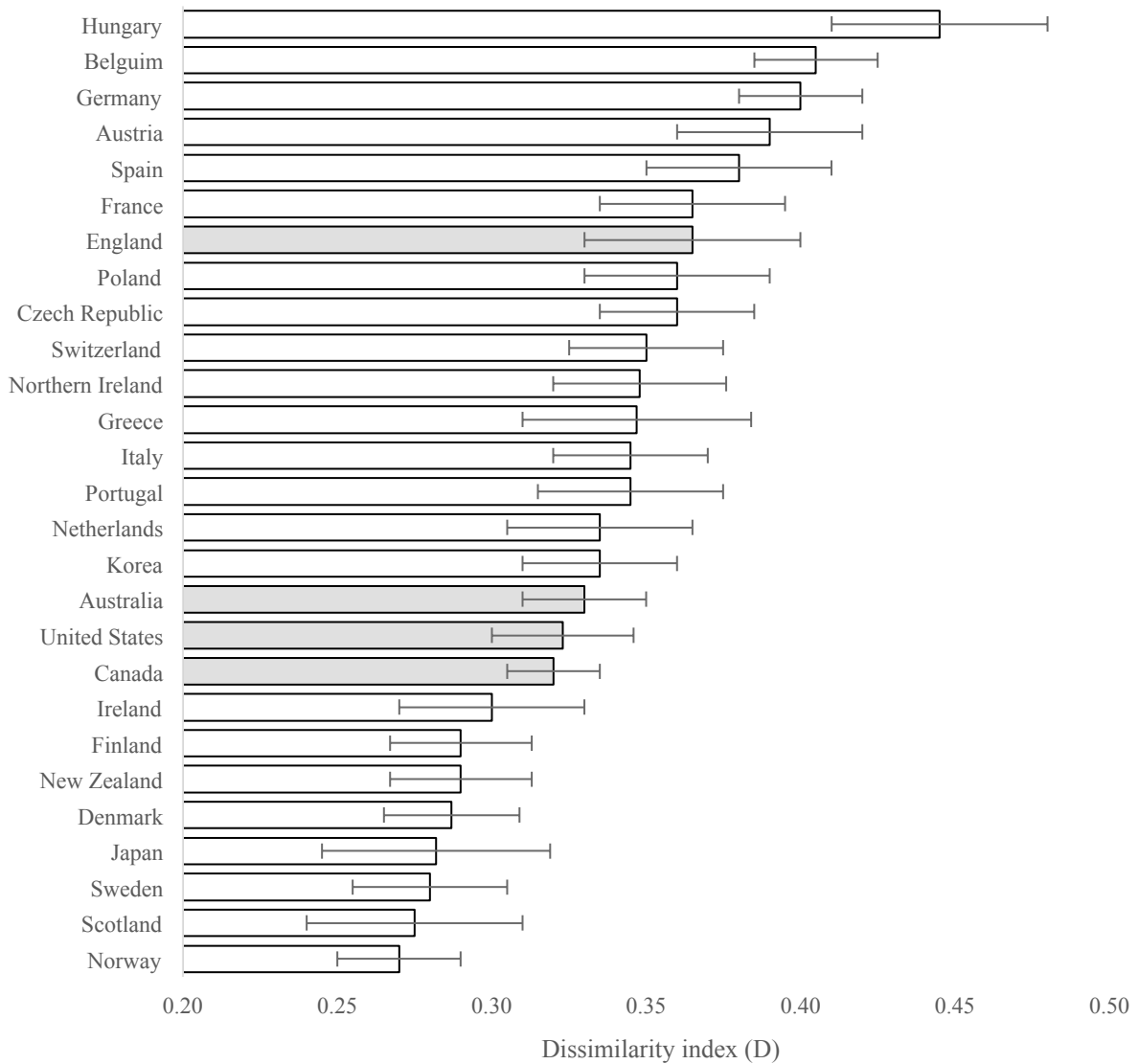
Notes: Thin black lines represents the 95 percent confidence intervals. Source = Bradbury et al (2012: Figures 4.2 and 4.4).

Figure 3. Mean scores by subject, age, country and parental education



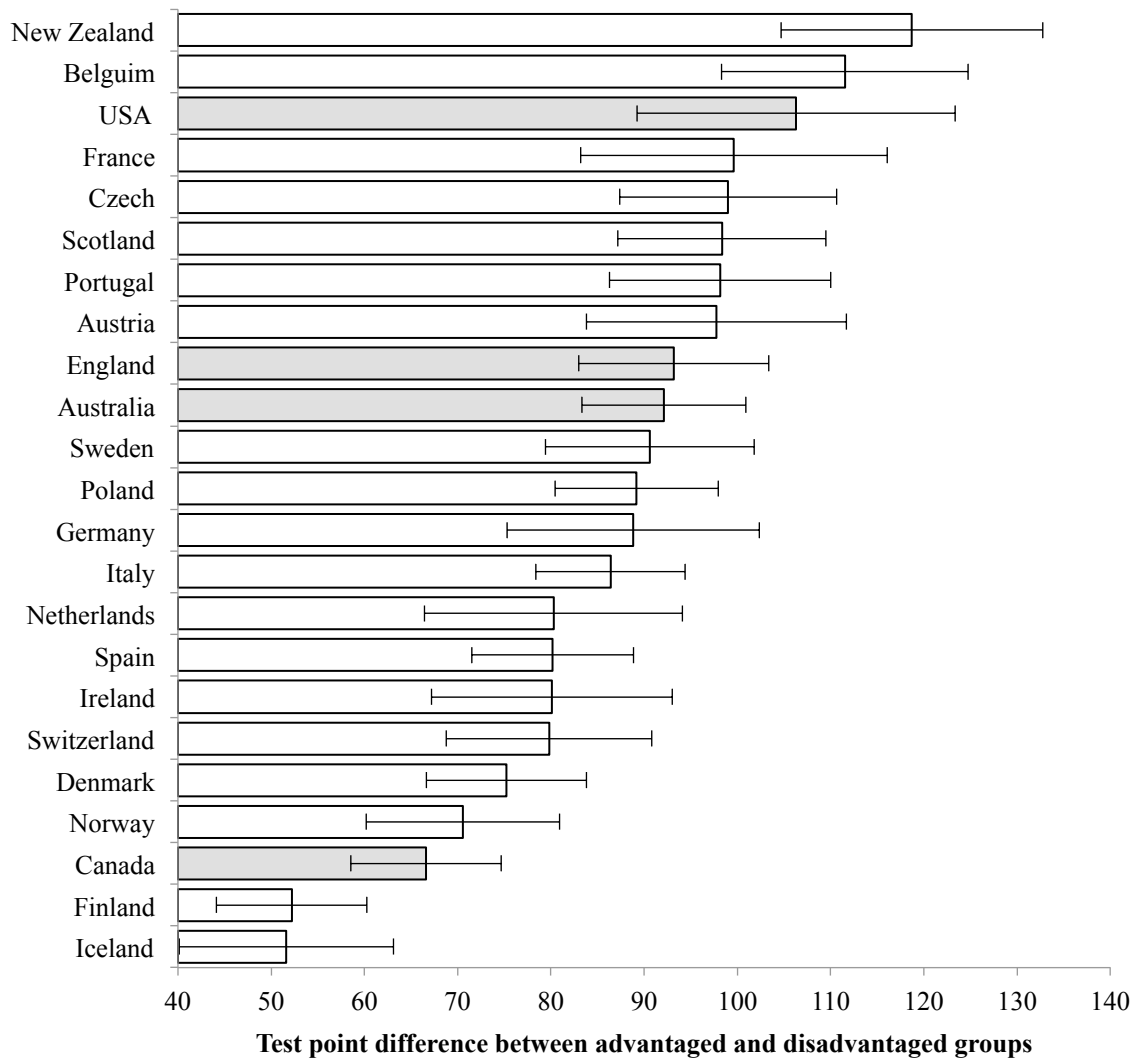
Notes: High Education corresponds to ISCED 5A and 5; Low Education corresponds to ISCED 2. Standardised scores are normalised to mean 0 and standard deviation 1 within each country and at each time point. As such, they can be interpreted as the performance of these groups, relative to the average performance of the population as a whole. No direct comparisons should be made between raw scores from the United States and England. Raw scores from the United States have been scaled, dividing by 50, in order that they are of a similar magnitude to the English raw scores. Source = Magnuson et al (2012: Figures 10.1 and 10.2).

Figure 4. Between secondary school segregation: a cross-country comparison



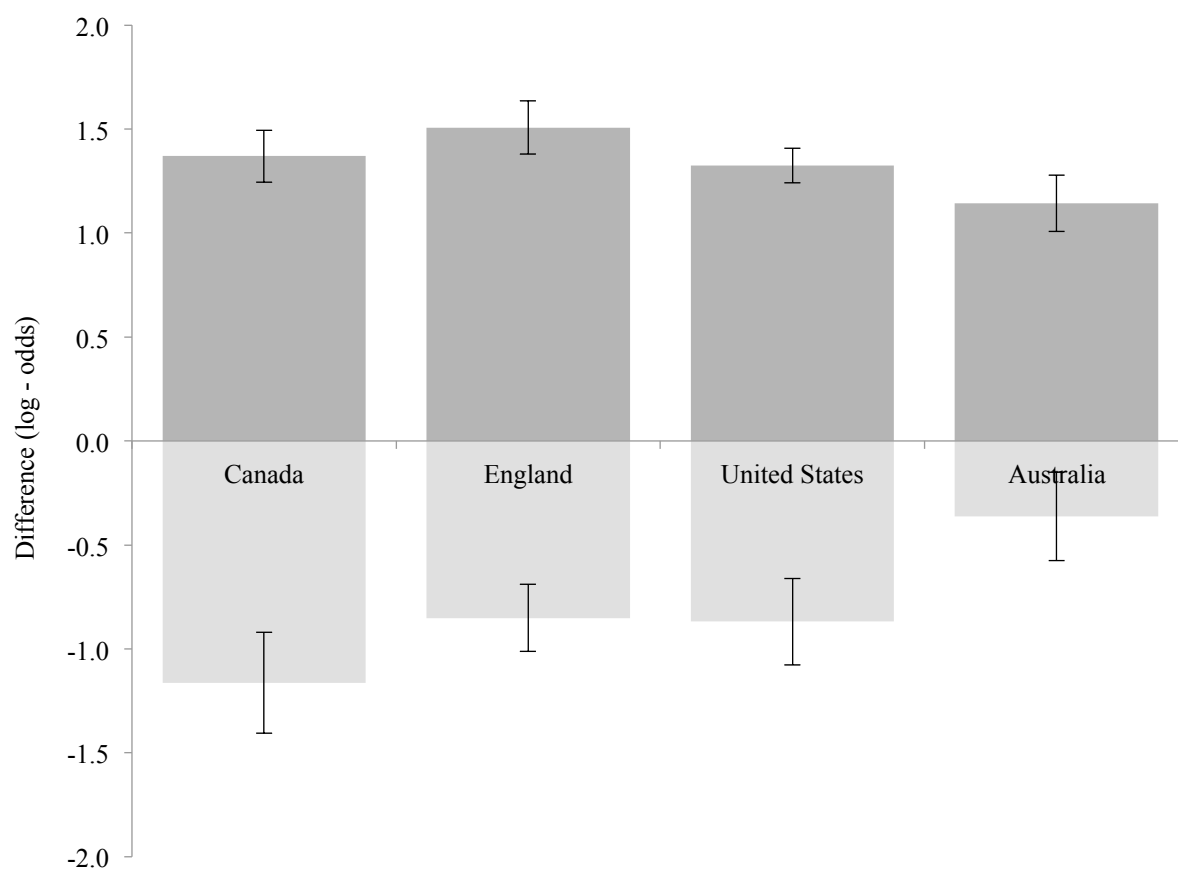
Notes: Figures refer to the dissimilarity index (D) of between school segregation. Greater values of D indicate more segregation. Thin black line running through centre of bars illustrate the estimated 95 percent confidence interval. Source = Jenkins et al (2008: Figure 1).

Figure 5. The social class gap in children’s PISA 2009 reading test scores



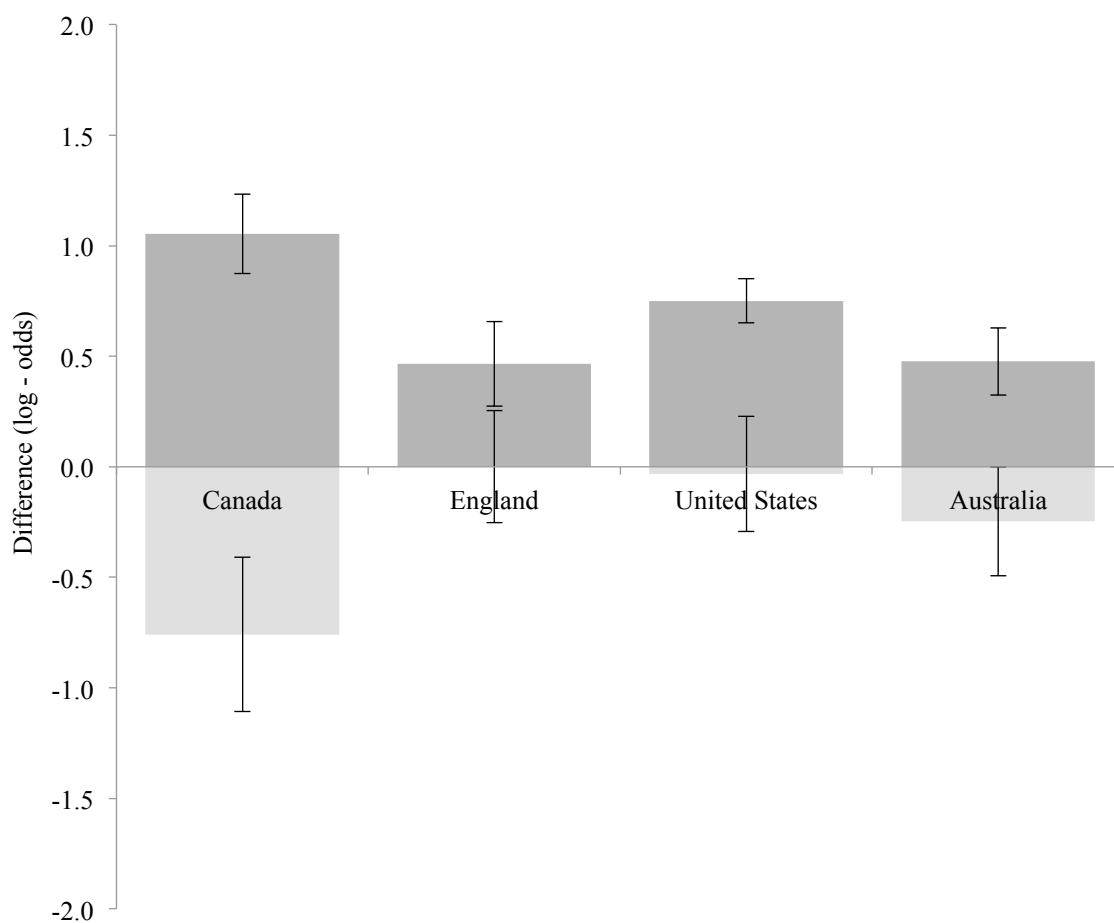
Notes: Figures refer to difference in PISA reading test scores between children from bottom and top national quintile of HISEI index of occupational status. Thin black line running through the centre of each bar is the estimated 95 percent confidence interval. Source = Jerrim (2011: Figure 3).

Figure 6. The socio-economic gap in college participation across Anglophone countries – Basic controls only



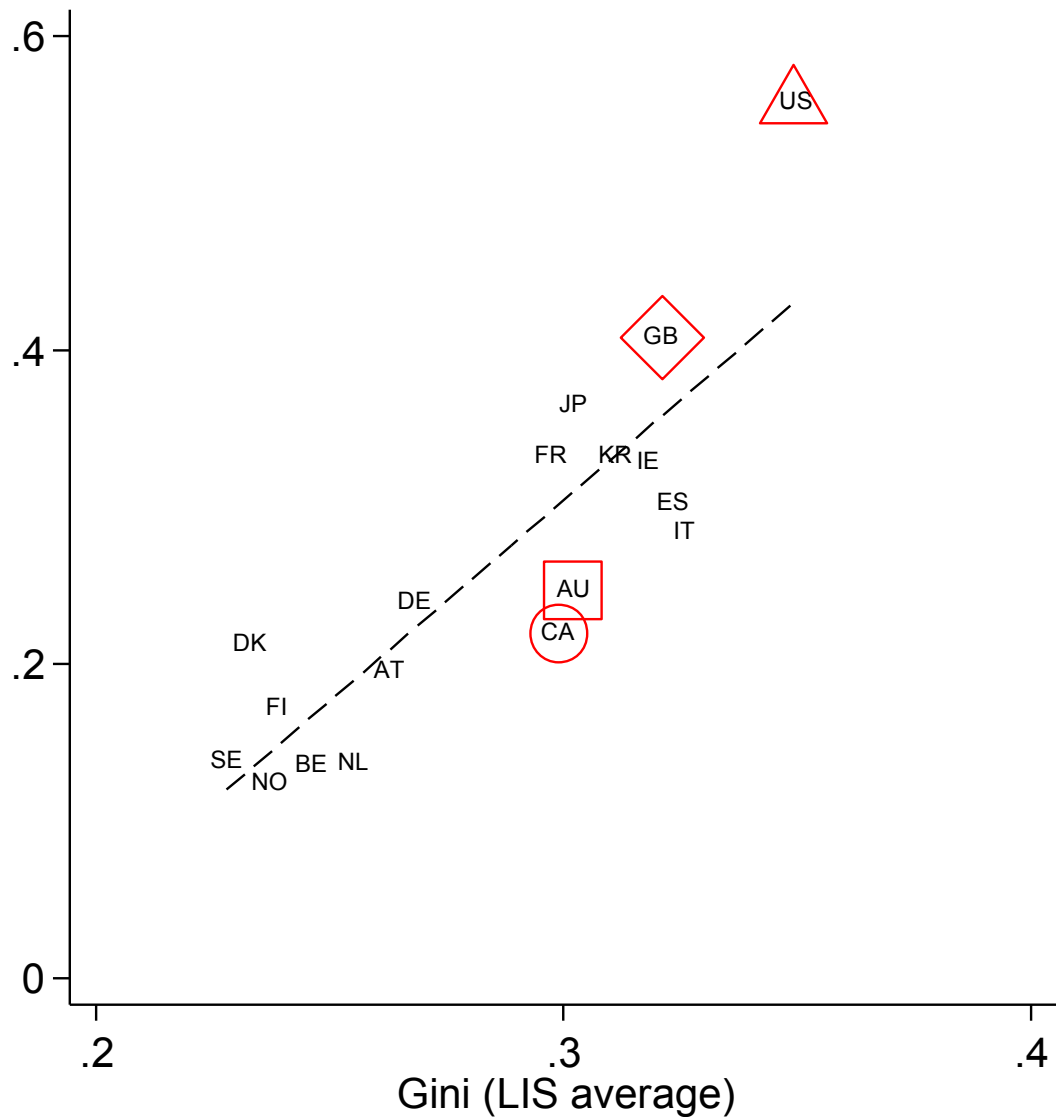
Notes: Figures for England refer to state school pupils only. The light grey segment of the bars illustrates the difference between ISCED 0 – 2 and ISCED 3 – 5B groups. Dark grey segments refer to the difference between ISCED 3 – 5B and ISCED 5A /6 groups. Thin black lines running through the centre are the estimated 90% confidence intervals. Source = Jerrim, Vignoles and Finnie (2012: Figure 2 Panel A).

Figure 7. The socio-economic gap in college participation across Anglophone countries – School grades at 18



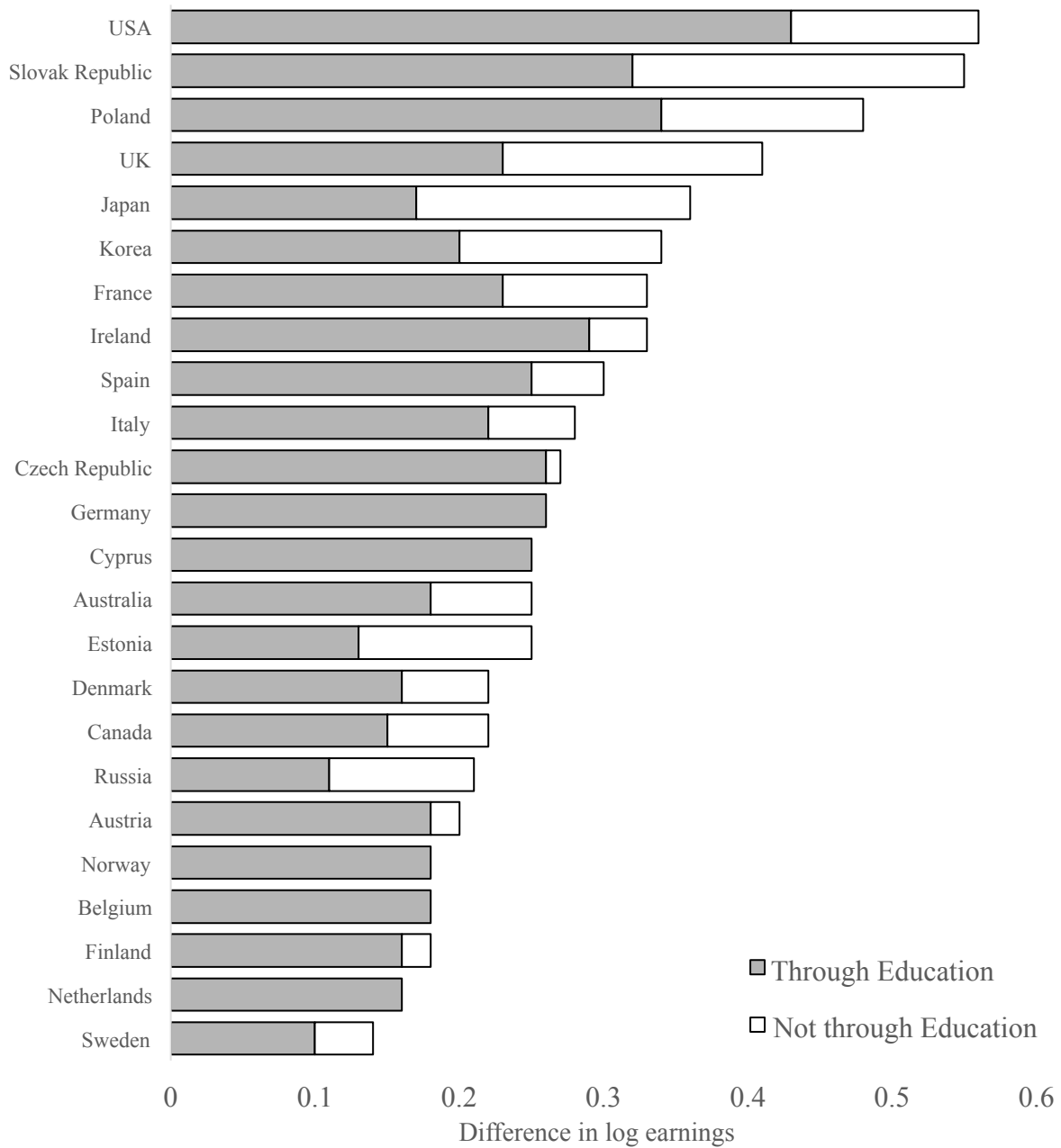
Notes: Figures for England refer to state school pupils only. The light grey segment of the bars illustrates the difference between ISCED 0 – 2 and ISCED 3 – 5B groups. Dark grey segments refer to the difference between ISCED 3 – 5B and ISCED 5A /6 groups. Thin black lines running through the centre are the estimated 90% confidence intervals. Source = Jerrim, Vignoles and Finnie (2012: Figure 2 Panel D).

Figure 8. The relationship between income inequality and intergenerational mobility



Notes: Income inequality is measured using the Gini coefficient and runs along the x-axis. The y-axis plots the difference in log earnings between individuals from high and low parental education backgrounds (larger figures illustrate lower levels of social mobility). Countries identified by their two letter country codes (see Table 3). Source = Jerrim and Macmillan (2014: Figure 3b).

Figure 9. A decomposition of the link between parental education and offspring earnings across countries



Notes: The lengths of the bars illustrate the difference in log earnings between individuals from high (bachelor degree) and low (high school only) parental education backgrounds. Grey segment illustrates the part of the intergenerational association that can be explained by differences in educational attainment between high and low parental education groups. White segment of bars illustrate the association between parental education and offspring earnings that remains after offsprings educational attainment has been controlled. Source = Jerrim and Macmillan (2014: Table 3).