

## *Chapter 1.1*

# The socio-economic gradient in educational attainment and labour market outcomes

A cross-national comparison

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### **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 of America). It uses a life course approach, where the magnitude of socio-economic disparities is 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 USA. Thus, drawing upon evidence from a collection of independent studies, we find little evidence to support suggestions that the USA 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 USA than in other comparable countries.

### **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 industrialized 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 led to increased interest in quantifying the size of socio-economic

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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 on 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 is presented in Figure 1.1.1.

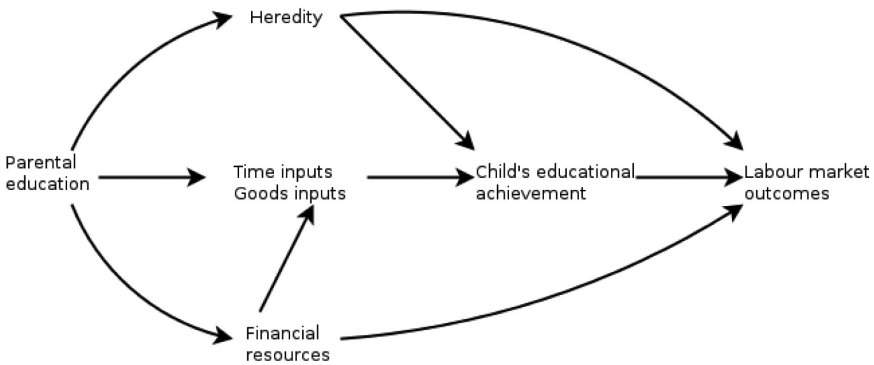


Figure 1.1.1: Simplified framework of home investments in children

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

There are two key transmission mechanisms driving the link between parental education and children'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 children<sup>4</sup>. 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, especially in broadly similar cultural contexts.

However, Figure 1.1.1 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, purchase additional educational resources such as private tutoring or access to a high-quality school. Highly educated parents are also much more likely to make non-financial investments in their

## *The socio-economic gradient in educational attainment*

children, such as visiting museums, eating meals together or reading bedtime stories. Unlike the case of heredity, it may well be that the effectiveness of these parental investments varies 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. 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 raised. 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)<sup>5</sup>.

This chapter presents cross-national comparative evidence for four rich English-speaking countries (Australia, England, Canada and the United States of America), focusing upon the link between family background (typically measured using parental education on a scale designed to be comparable across countries) and children's educational attainment and labour market outcomes. These nations share a number of cultural similarities, including language and political systems, while also having important economic and historical ties. However, they 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 of America (Blanden, 2013). A growing body of literature is trying to explain this.

We review this literature throughout this chapter, comparing socio-economic achievement gradients across these four countries and 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-nationally comparative data sets, such as the Program for International Student Assessment (PISA), Trends in International Mathematics and Science Study (TIMSS) and the Program 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 data sets 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 data sets are not available. On these occasions, we draw upon evidence that has harmonized a set of existing national specific data sets ex-post (i.e. after data collection). In doing so, this chapter seeks to establish whether any broad generalizations 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?

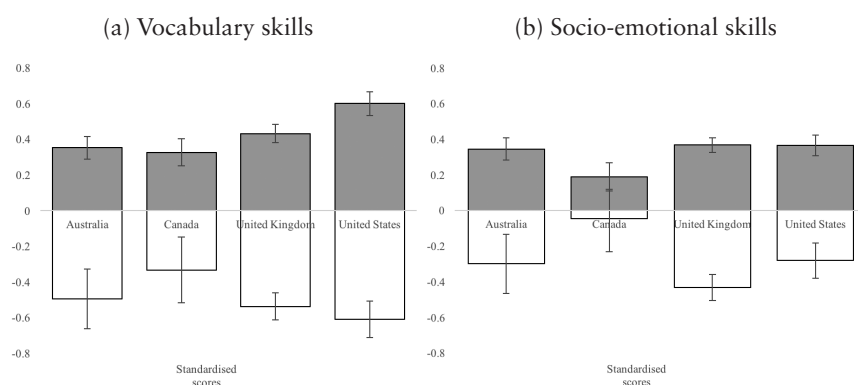
## Preschool

Socio-economic differences in children's educational investments begin in-utero (e.g. quality of pre-natal care) and continue during the first years of life (e.g. interaction with the child). Thus, large parental education differences in cognitive and social skills emerge even before children begin 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 UK and the USA. Figure 1.1.2 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.

In the USA, children with highly educated parents score (on average) 1.2 standard deviations (estimated by Bradbury *et al.* to be approximately equivalent to between 17 and 24 months of development at this age) 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 difference is 0.97 standard deviations in the UK

## The socio-economic gradient in educational attainment

and 0.85 in Australia. The smallest difference is found in Canada (0.66 standard deviations), almost half the size of that found in the USA. Yet it is interesting to note that Bradbury *et al.* 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 falls to around 0.87 in the UK and the USA, 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 1.1.2 panel A.



**Figure 1.1.2:** Differences in vocabulary and socio-emotional skills by age 4/5 by parental education group: A cross-country comparison

**Notes:** Thin black lines represent the 95 percent confidence intervals.

Source: Bradbury *et al.* (2012: Figures 4.2 and 4.4).

Do similarly large parental education differences exist in terms of children's socio-emotional 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 nation-specific longitudinal data sets. Specifically, they illustrate differences in externalizing behaviour problems (using items from the Strengths and Difficulties Questionnaire) by parental education group. Key findings from this analysis are presented in Figure 1.1.2 panel B.

Parental education differences in infants' socio-emotional skills are greatest in the UK, 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 USA (0.64 standard deviations). Further inspection of Figure 1.1.2 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 UK compared to 0.3

in Australia and the USA). 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, the same broad cross-national pattern continues to hold even after race, ethnicity and nativity have been controlled.

### Primary school

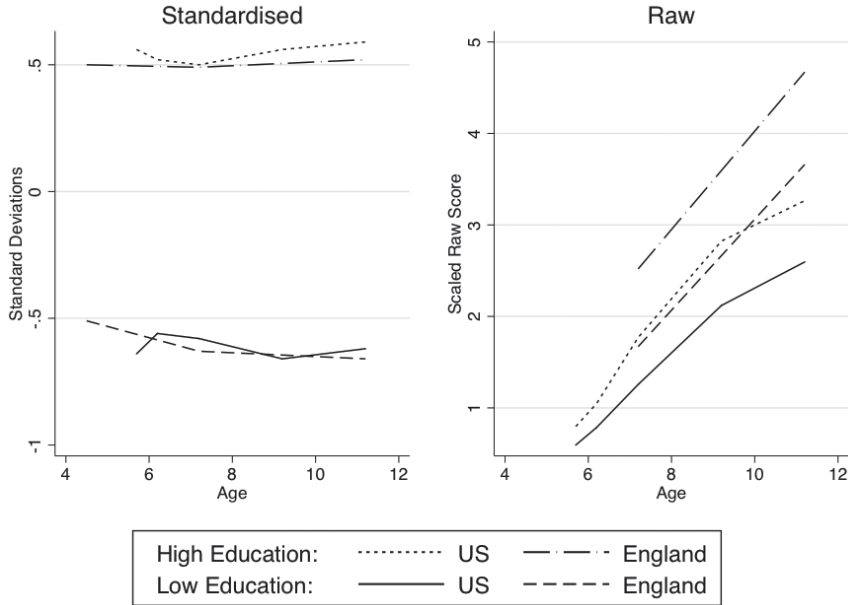
The previous section illustrated that there are substantial differences in children’s outcomes by parental education group even before compulsory schooling has begun and that these differences are noticeably larger in some countries than others. Perhaps this is understandable: pre-school provision may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

Using longitudinal data from the USA (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 attainment and how these change during primary school (treated here as between ages five and eleven)<sup>6</sup>. They analyse scaled and standardized measures of children’s achievement in reading and maths over this period. Both metrics have their strengths and limitations. Standardized 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 standardizing scores, one is unable to capture increases 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. However, unless they have been explicitly designed to be comparable across countries and time (e.g. PISA scores), they cannot be used when comparing across countries or cohorts.

Figure 1.1.3 illustrates how the link between parental education and children’s reading test scores changes over time in England and the USA, drawing upon the study by Magnusson *et al.* (2012)<sup>7</sup>. The left-hand panel considers changes in standardized scores. The results at early ages confirm our findings from the previous section: children’s performance is already highly socially graded by approximately age five. In England, those whose parents have the most education perform one standard deviation higher than their less advantaged peers. The gap is slightly wider in the USA than

*The socio-economic gradient in educational attainment*

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 1.1.3:** 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 USA and England. Raw scores from the USA have been scaled dividing by 50, so that they are of a similar magnitude to the English raw scores.

Source: Magnuson et al. (2012: Figures 10.1 and 10.2).

Our primary interest here is to show how social gradients in academic achievement evolve during primary school. The results do not differ much between England and the USA. The relative difference between the high and low parental education groups narrows slightly (to approximately 1.1 standard deviations) in the USA between ages 5 and 7, before widening again between ages 7 and 11. 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 1.1.3 panel B turns to the analysis of scaled scores. 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 between the lines for each level of parental education. The parental education gradient in scaled reading skills scores in the USA grows from around 10 points at age 5 to around 30 points at age 11 (despite standardized scores remaining constant). This is being driven by the increase in the dispersion of skill (and thus scaled scores) as children age.

## Secondary school

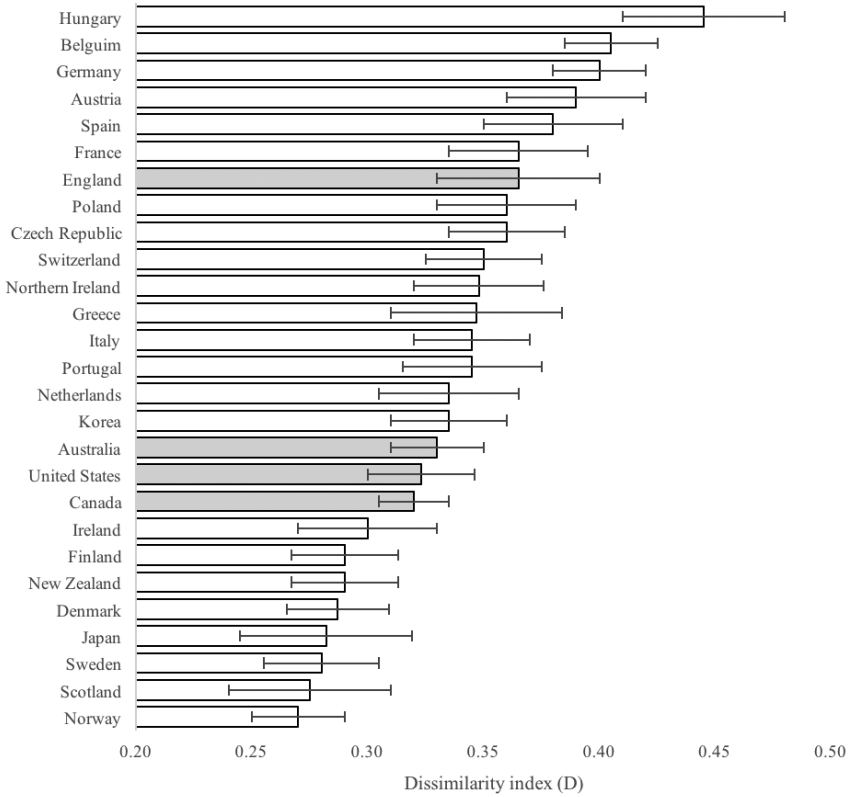
Socio-economic inequalities may be exacerbated during secondary education, particularly in countries where there are high levels of between-school segregation (Hanushek and Wößmann, 2006). Indeed, returning to the Haveman and Wolfe (1995) framework presented in Figure 1.1.1, school quality may be considered one of the major differences in educational investments between advantaged and disadvantaged groups.

Jenkins *et al.* (2008) use the 2000 and 2003 rounds of the Program for International Student Assessment (PISA) to illustrate the extent to which 15-year-old pupils from different social backgrounds (this time measured through occupational status) are found within different schools. Their key findings are presented in Figure 1.1.4, with greater values of the dissimilarity index ( $D$ ) representing more between-school segregation (specifically ' $D$  may be interpreted as the fraction of pupils with low social position that would need to be moved to different schools, without replacing them by other children, in order that every school had the same shares of children with low and high social background in the country as a whole', Jenkins *et al.*, 2008: 24).

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 UK 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 1.1.4 is that the USA 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).



*The socio-economic gradient in educational attainment*



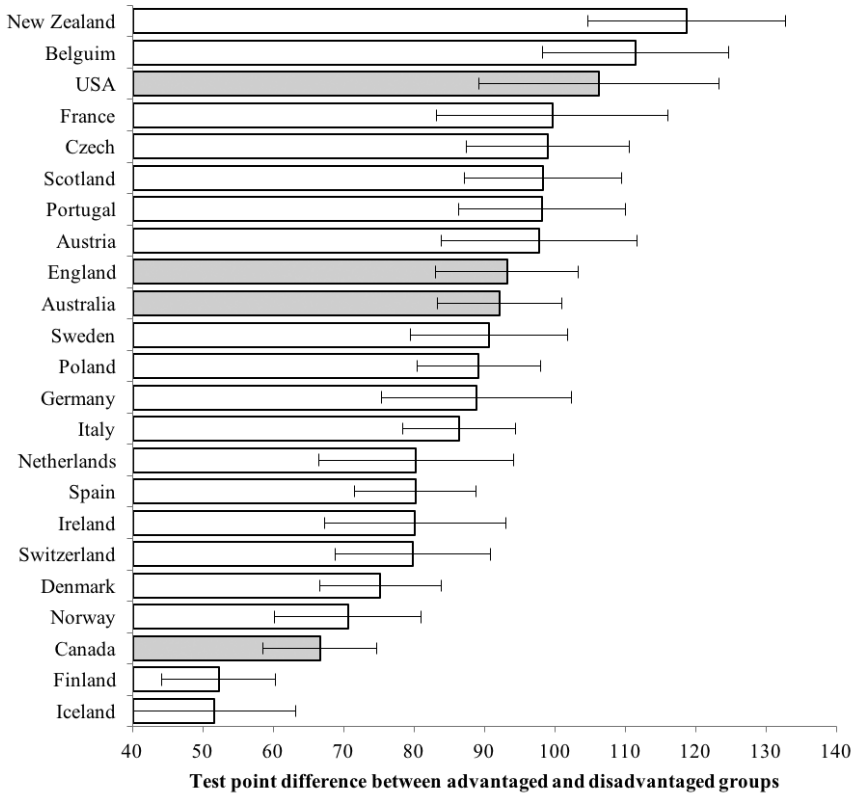
**Figure 1.1.4:** Between-secondary-school segregation: A cross-country comparison  
**Notes:** Figures refer to the dissimilarity index (D) of between-school segregation. Greater values of D indicate more segregation. The thin black line running through the centre of bars illustrate the estimated 95 per cent confidence interval.

Source: Jenkins *et al.* (2006)

How big are social class gaps in educational achievement as children reach the latter stages of secondary school? Figure 1.1.5 from Jerrim (2012) compares PISA reading test scores between 15-year-olds from advantaged and disadvantaged backgrounds<sup>8</sup>.

Of the 23 countries considered, the USA 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 being around 0.9 standard deviations (i.e. 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 USA than in neighbouring Canada. Jerrim's (2012) work 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 summarized in Table 1.1.1.



**Figure 1.1.5:** 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. The thin black line running through the centre of each bar is the estimated 95 per cent confidence interval.

Source: Jerrim (2012: Figure 3).

In the USA, the highest achieving children from disadvantaged backgrounds are approximately 2.5 school years behind the highest achieving children from affluent backgrounds. This difference is bigger than in almost every

*The socio-economic gradient in educational attainment*

other country considered. A gap almost as large exists in Australia (2 years and 2 months of schooling) and England (2 years and 5 months of schooling), but Canada's is notably smaller (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 USA, even the highest achieving children from disadvantaged backgrounds lag substantially behind their more advantaged peers.

**Table 1.1.1:** 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

	Lowest achievers		Highest achievers	
	Years of schooling gap	SE	Years of schooling gap	SE
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 (2012: Table 4) and unpublished results.

### Post-secondary education

Attending higher education (HE) potentially has large effects on young people’s future labour market outcomes. As such, differences in access to university may be an important driver of later inequalities. However, cross-national comparisons in this area pose 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 1.1.2.

**Table 1.1.2:** 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 population starting bachelor’s degree by age 20	45	37	43	39

*The socio-economic gradient in educational attainment*

	US	England	Canada	Australia
% of population 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 enrolled 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 fees 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

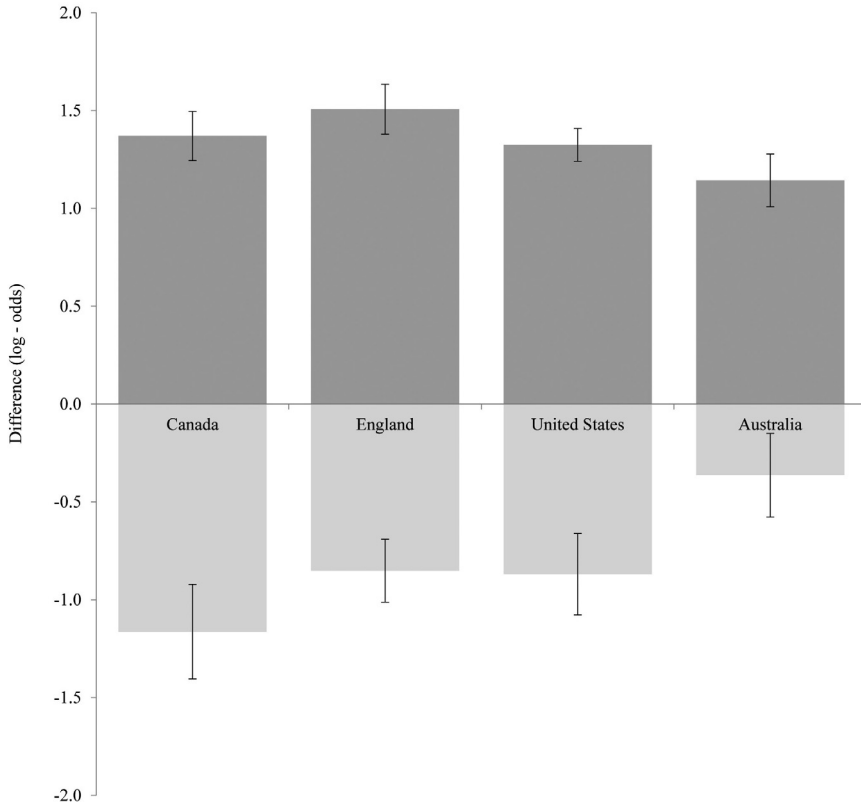
**Notes:** Tuition fee figures for England refer to pre-2012, which is the relevant time period for the analysis.

Source: Jerrim and Vignoles (2014: Table 1).

With such different systems, one might expect substantial differences in access to higher education across these countries. In Figure 1.1.6, Jerrim *et al.* (2012) illustrate 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.

There is substantial inequality 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 difference being slightly larger in England and Canada, and somewhat smaller in Australia. Perhaps surprisingly, it is not the USA where the link between parental education and university access is greatest (despite private costs of attending university in this country being particularly high).



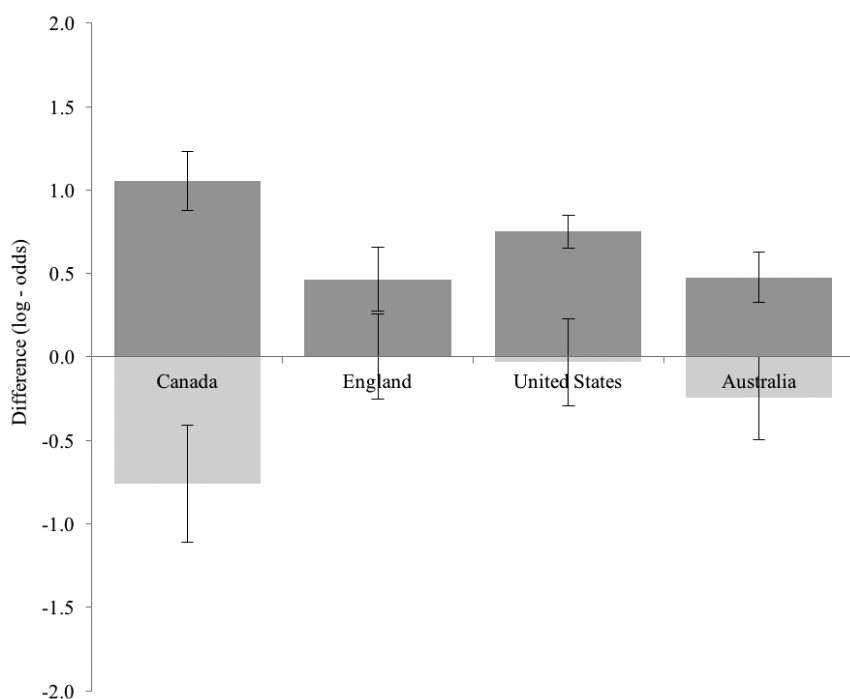
**Figure 1.1.6:** The socio-economic gap in college participation across Anglophone countries. Basic controls only

**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 per cent confidence intervals.

Source: Jerrim *et al.* (2012: Figure 2 panel A).

However, part of this link between parental education and university access may be explained by achievement differences that have emerged by the end of secondary schooling. Figure 1.1.7 shows the differences in university access by parental education group once a range of cognitive test scores and school grades up to age 18 have been held constant (Jerrim *et al.*, 2012).

## The socio-economic gradient in educational attainment



**Figure 1.1.7:** 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 per cent confidence intervals.

Source: Jerrim *et al.* (2012: Figure 2 panel D).

Unsurprisingly, in all four countries prior attainment is a key determinant of entering university. Moreover, as it 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 are almost entirely explained by prior achievement in three of the four countries (Canada being the exception).

Jerrim *et al.* (2012) also find that, after controlling for parental education and prior attainment, low parental income is no longer a significant predictor of enrolment into a bachelor's degree in any of the four countries. This concurs with previous evidence suggesting that it is

longer-run indicators of advantage, rather than short-run resources at the time of entry, that affect university participation (Carniero and Heckman, 2002; Dearden *et al.*, 2004)<sup>9</sup>.

Access to elite universities potentially offers greater economic rewards than that to other, lower status institutions. Yet there may be additional barriers to entry (Pallais and Turner, 2006). Jerrim *et al.* (2012) illustrate that in each of the four countries considered, the link between parental education and access to such elite institutions is larger than that for entry into higher education more generally. While these differences are substantially reduced once academic achievement in secondary school has been taken into account, Jerrim *et al.* (2012: 21) find that ‘children from advantaged backgrounds [continue to be] a further eight percentage points more likely to attend a selective institution’. Similar results emerge for Jerrim *et al.* (2015: 31), 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 USA (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 USA (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 as cognitive skills within the adult population. Table 1.1.3 reproduces figures from Jerrim and Macmillan’s (2015) findings from the cross-nationally comparable Program for International Assessment of Adult Competencies (PIAAC) data set. These refer to differences in numeracy test scores between men



### *The socio-economic gradient in educational attainment*

aged 25 to 59 from low (high school or less) and high (bachelor degree and higher) backgrounds.

**Table 1.1.3:** 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 (2015: Table 4).

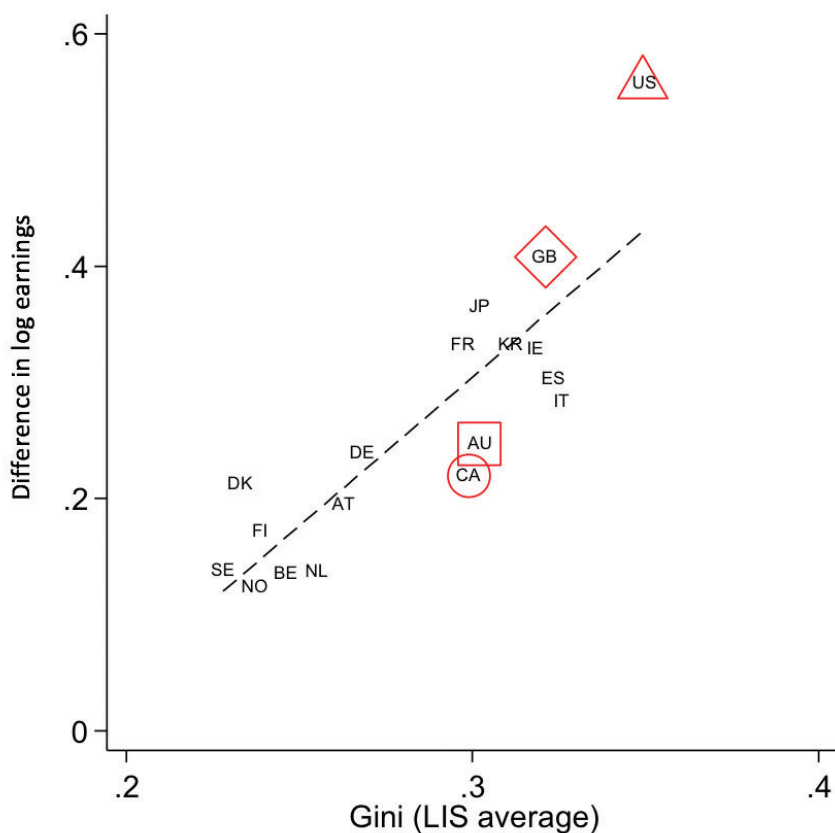
In every country, there is a strong and statistically significant association between parental education and the numeracy skills of adults. However, there is also evidence of cross-national variation. Socio-economic inequality in adult skills is particularly strong in the USA and the UK, where men

from a low parental education background obtain a PIAAC numeracy score more than one standard deviation below their advantaged peers. Figures for Canada (0.78) and Australia (0.66) are much smaller, suggesting that the USA and the UK 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 (2015) use the OECD Program for International Assessment of Adult Competencies (PIAAC) data set to examine the link between parental education and labour market outcomes. The vertical axis of Figure 1.1.8 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 USA (triangle) are highlighted.

A number of interesting features stand out. First, there is a strong relationship between income inequality and intergenerational mobility, with a correlation coefficient of 0.85, demonstrating ‘the outcome of a whole host of ways that inequality of incomes affects children’ (Corak, 2013:7). Second, income inequality is slightly lower in Australia and Canada than in England, while the USA stands out as being particularly 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 difference differs substantially by country. The high–low parental education earnings gap is approximately 25 per cent in Canada and Australia, compared to around 40 per cent in the UK and almost 60 per cent in the USA. Australia and Canada can thus be characterized as having moderate levels of both income inequality and intergenerational mobility by international standards. In contrast, the UK and (particularly) the USA have comparatively high levels of income inequality and low levels of social mobility.



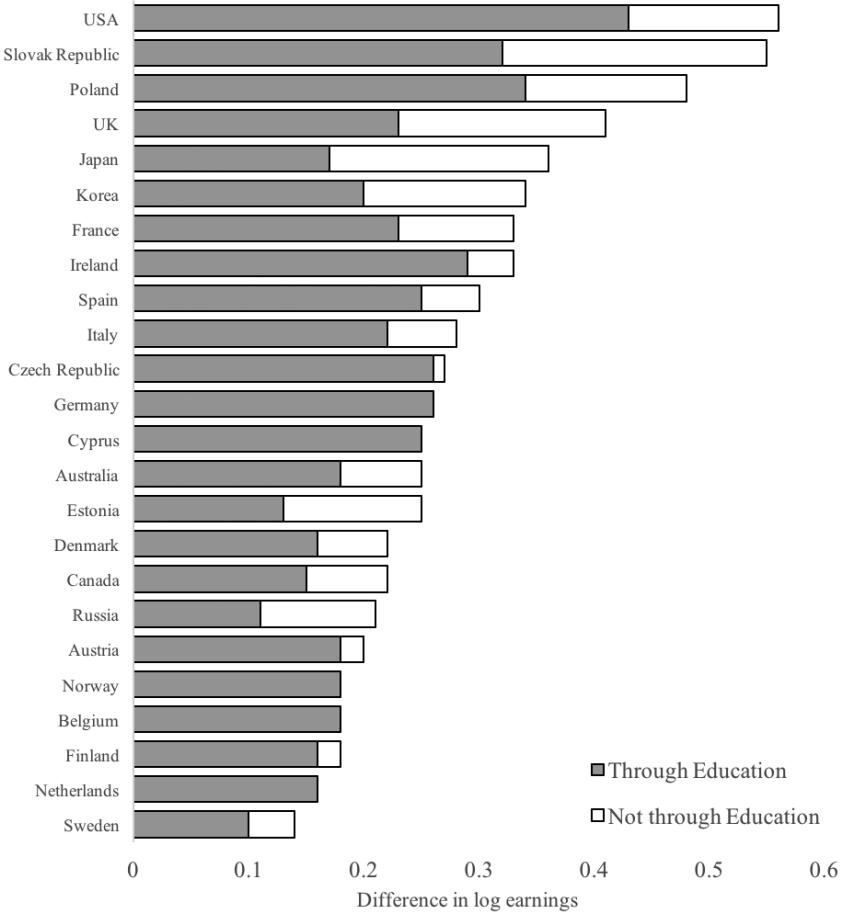
**Figure 1.1.8:** The relationship between income inequality and intergenerational mobility

**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 1.1.3).

Source: Jerrim and Macmillan (2015: Figure 3b).

The Haveman and Wolfe (1995) framework presented in Figure 1.1.1 suggested that educational attainment is one of the most important factors mediating this link between parental education and the labour market outcomes of offspring. Figure 1.1.9 summarizes Jerrim and Macmillan’s (2015) investigation of 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’). The length of the bars illustrates the total association between parental education and offspring earnings. The grey portion then illustrates the magnitude of the ‘through education’ effect.



**Figure 1.1.9:** 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 segments illustrate the part of the intergenerational association that can be explained by differences in educational attainment between high and low parental education groups. White segments of each bar illustrate the association between parental education and offspring earnings that remains after children’s educational attainment has been controlled.

Source: Jerrim and Macmillan (2015: Table 3).

Education is an important driver in the intergenerational transmission of (dis)advantage. In most countries, the association between parental education and children's earnings is reduced by approximately three quarters once educational attainment has been controlled for. However, this varies across countries. 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 7 per cent earning gap remains between high and low parental education groups in Australia and Canada, 13 per cent in the USA and 18 per cent in the UK. Indeed, only around half of the total intergenerational association can be explained by educational attainment in the UK, compared to 70 to 75 per cent in Australia, Canada and the USA. The UK 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.

## **Conclusions**

Understanding the relationship between family background, educational attainment and 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 chapter has reviewed evidence on the 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 USA) at a number of key points in young people's lives.

Table 1.1.4 summarizes our results. Socio-economic inequalities are large in all four countries, and 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. Some countries seem more successful in equalizing opportunities across social groups than others. The first row of Table 1.1.4 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 USA. When in primary school, socio-economic gaps in reading and maths test scores in the UK and the USA 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 USA stands out as having a particularly strong relationship between family background and children's

test scores towards the end of secondary education (while this association is significantly weaker in Canada than the other three countries).

**Table 1.1.4:** 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 education)	% difference	ED	7	7	20	14

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

Somewhat surprisingly, the same pattern does not hold for post-secondary education, with Table 1.1.4 suggesting Australia is the most equal, Canada

## *The socio-economic gradient in educational attainment*

the least equal, with the UK and USA sitting in between the two. However, a familiar pattern returns at the bottom of Table 1.1.4, where we see that individuals from low parental education backgrounds in the USA earn 75 per cent less than their peers from high parental education backgrounds. This gap is notably bigger than in countries like Canada and Australia, where the analogous earnings differential is little more than 25 per cent. 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 USA and weakest in Canada, with Australia and the UK generally falling between the two. This is clearly at odds with the notion that the USA 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 1.1.1, 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 USA and the UK.

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). 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). In our view, the reality 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. Just as we have used a life course approach to understand the magnitude of socio-economic inequalities, however, policymakers may need to do the same if they are to succeed in reducing them.

### Notes

<sup>1</sup> (<https://ec.europa.eu/programs/horizon2020/>)

<sup>2</sup> [www.pathwaysto adulthood.org/](http://www.pathwaysto adulthood.org/)

<sup>3</sup> <http://jacobsfoundation.org/>

<sup>4</sup> This statement ignores gene–environment interaction effects, which suggest that heredity is more complex than outlined here (see, for instance, Perry, 2002 and

Turkheimer *et al.*, 2003). Nevertheless, we do not believe this undermines the overall argument of a heritable component of intergenerational transfer of skills.

<sup>5</sup> This approach also provides pointers to how we might reduce inequalities, by comparing institutional differences between countries. However, we should note that the term ‘institutions’ must be interpreted broadly for findings to be interpreted in the ways discussed above. They refer not just to formal institutions, such as ways in which schooling systems are organized, but also to informal institutions, such as income inequality (Jerrim and Macmillan, 2015) and attitudes among society at large.

<sup>6</sup> 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 UK and the USA).

<sup>7</sup> Magnusson *et al.* (2012) also present evidence on maths test scores, though these are similar to those for reading and therefore not presented here for brevity.

<sup>8</sup> 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 (Ganzeboom *et al.*, 1992).

<sup>9</sup> 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).

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*Jake Anders and John Jerrim*

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