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GGC: Is Education the Key?

Income Inequality, Intergenerational Mobility, and the Great Gatsby Curve: Is Education the Key?

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It is widely believed that countries with greater levels of income inequality also have lower levels of intergenerational mobility. This relationship, known as the Great Gatsby Curve (GGC), has been prominently cited by high-ranking public policymakers, bestselling authors, and Nobel Prize–winning academics. Yet, relatively little cross-national work has empirically examined the mechanisms thought to underpin the GGC—particularly with regard to the role of educational attainment. This paper uses the cross-nationally comparable Programme for International Assessment of Adult Competencies (PIAAC) data set to shed new light on this issue. We find that income inequality is associated with several key components of the intergenerational transmission process—including access to higher education, the financial returns on education, and the residual effect of parental education upon labor-market earnings. Thus, consistent with theoretical models, we find that educational attainment is an important driver of the relationship between intergenerational mobility and income inequality. We hence conclude that unequal access to financial resources plays a central role in the intergenerational transmission of advantage.

Introduction

Income inequality is high and rising in a number of developed countries (OECD 2012). There is widespread concern that this may lead to lower levels of intergenerational mobility. For instance, Ermisch, Jäntti, and Smeeding (2012, 3) stated that:

> Of all the potential consequences of rising economic inequality, none is more worrisome than the possibility that rising inequality will have the long-term effect of reducing equality of opportunity and intergenerational mobility.

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This statement was supported by Duncan and Murnane (2011, 20):

> Only if our country [the United States] faces the consequences of growing income inequality will it be able to maintain its rich heritage of upward social mobility.

A key reason why many believe income inequality and intergenerational mobility are linked is that this can be observed cross-nationally; economically unequal countries are the least socially mobile. This is often demonstrated via a graph that plots the Gini coefficient (income inequality) against the intergenerational income elasticity (a measure of social mobility). An upward-sloping line, then, demonstrates what has become known as the "Great Gatsby Curve (GGC)"; greater income inequality is associated with less social mobility.

This finding has been subject to much attention. It has been cited by Nobel Prize–winning economists (Heckman 2013), high-ranking policymakers (White House 2013; Obama 2013), bestselling authors (Wilkinson and Pickett 2009), and the popular science press (*Economist* 2013). Indeed, Professor Alan Krueger (2012) even used the curve to predict that, due to recent increases in income inequality, income mobility will further decline in the United States over the next 25 years.

Yet, despite widespread interest in the GGC, relatively little work has examined the mechanisms thought to underpin it. This includes the role of educational attainment, a factor many sociologists and economists deem critical in the transmission of (dis)advantage across generations (Duncan and Hodge 1963; Blau and Duncan 1967; Becker and Tomes 1986; Hout 1988; Ishida, Müller, and Ridge 1995; Breen and Goldthorpe 2001; Breen and Jonsson 2007; Duncan and Murnane 2011). Although recognition of the importance of education dates back to Blau and Duncan (Blau and Duncan 1967; Duncan and Hodge 1963), few empirically examined the role of education in social mobility until the 1990s (Ganzeboom, Treiman, and Ultee 1991; Breen and Jonsson 2005). Since then, numerous studies have considered how education mediates the link between social origin and destination, including how this compares across national settings (see Breen and Jonsson [2005] for a review). However, there is little evidence as to how this is then linked to income inequality. This paper fills this gap by examining cross-national variation in the relationship between parental education, educational attainment of offspring, and labor-market outcomes, and whether stronger associations are found in societies with more income inequality. We address the following research questions.

First, we ask whether there is indeed a strong link between income inequality and intergenerational mobility. As noted by Saunders (2012), Jäntti and Jenkins (2013), and Blanden (2013), different methods have been used across countries to produce the income mobility estimates usually plotted on the GGC, with substantial differences across countries in terms of data quality. Indeed, two experts recently emphasized how, despite the prominence of the GGC, relatively little is actually known about the link between income inequality and intergenerational mobility (Jäntti and Jenkins 2013, 188). They have therefore highlighted the need for further work in this area—particularly greater use of cross-nationally comparable data.

Our first aim is to provide new evidence closely related to what the aforementioned academics are calling for. Specifically, the cross-nationally comparable Programme for International Assessment of Adult Competencies (PIAAC) data set is used to investigate the link between comparable measures of *parental education* and offspring's earnings. We thus investigate whether the GGC can be replicated using an alternative definition of intergenerational mobility and data designed to facilitate such international comparisons.

Research Question 1. How does the link between parental education and offspring's earnings vary across countries? Is this association stronger in more unequal countries?

Our second contribution is to consider the role of offspring's educational attainment in forming our version of the GGC. Despite the prominence of education in theoretical models of intergenerational persistence (Blau and Duncan 1967; Sewell and Ohlendorf 1970; Boudon 1974; Breen 2004), relatively little empirical work has examined whether this may be driving the link between income inequality and mobility. (Gregg et al. [2013] is an exception, who investigate the role of education in explaining income mobility across Sweden, the UK, and the United States. They find that Sweden has the most income mobility, due to smaller "residual" effects of parental income on offspring's earnings, and lower returns to education). We further the research of Gregg et al. (2013) by investigating whether educational attainment mediates the intergenerational transmission process, how this varies across several countries, and whether this is independently associated with income inequality.

Research Question 2. Does educational attainment mediate the relationship between parental education and offspring's earnings? Is this "through education" effect stronger in more unequal countries? Is there also an association between income inequality and "residual" family background effects?

Finally, our decomposition shows that the mediating effect of education operates through two channels:

(i) The socio-economic gradient in offspring's educational attainment ("access to education"); and
(ii) The labor-market value of qualifications ("returns to education").

Both are likely to vary across countries. For instance, returns to education will depend upon the structure of a country's economy (e.g., the main industries and whether they require an educated workforce) and the supply and demand for skills. Likewise, returns will also be influenced by structural factors, such as young people's willingness to migrate to find employment (i.e., whether they can "match" their skills to an appropriate job) and the strength of labor unions. However, we argue that both channel (i) and (ii) will also be stronger in more

unequal countries (Solon 2004; Breen and Jonsson 2005; Mayer 2010). Our final aim is to bring data to bear on these issues by investigating whether (a) income inequality is linked to differences in university completion rates by parental education group; (b) the returns to education are indeed higher in more unequal countries; and (c) if either stands out as a particularly important driver of our version of the GGC.

Research Question 3. Is the relationship between parental education and access to higher education stronger in more unequal countries? Are the economic returns to education greater in more unequal countries?

Note that our objective is to establish whether strong *associations* between income inequality and intergenerational opportunities exist at the cross-country level, and the extent to which educational attainment is an important mediating factor. Although establishing causality is clearly an important long-term goal, it is beyond the scope of this paper and the data currently available.

Theoretical Framework and Empirical Methodology

Becker and Tomes (1986), Breen and Jonsson (2005), Corak (2013), Duncan and Murnane (2011), and Solon (2004) argue that in societies with greater inequality, there are larger disparities in the resources invested in children between rich and poor. This begins in utero (e.g., quality of prenatal care), and continues throughout early childhood via educational inputs (including parental time). Consequently, large socio-economic differences in cognitive functioning emerge before compulsory schooling has begun (Becker 2011; Cunha et al. 2006). Income inequality then leads to greater school and neighborhood segregation (Harding et al. 2011), with disadvantaged children attending lower-quality schools than their more affluent peers (Garner and Raudenbush 1991; Mayer 2002). This, along with continuing disparities in educational investments, reinforces the skill gap between socio-economic groups. Thus, by the end of secondary school, there will be substantial differences in academic abilities (Marks 2014), future aspirations (Sikora and Saha 2007), and a range of other social ("noncognitive") skills (Erikson and Jonsson 1996).

This will influence whether children obtain a bachelor's degree (Jackson et al. 2007). Income inequality may also directly influence college access if low-income families cannot afford tertiary education (Jackson and Jonsson 2013) or the increasingly necessary extracurricular experiences (Lehmann 2012). Yet, college graduates earn substantially more than other groups (Hout 2012)—with these returns greater in more unequal labor markets. Moreover, family resources continue to matter, as the wealthy support their offspring during their job search (Lin 1999). Successful labor-market transitions are therefore harder for those from poor backgrounds, even conditional on educational attainment (Goldthorpe 2013)—particularly when labor markets are very unequal. The Great Gatsby Curve

presents "a summary of all these underlying gradients, reflecting the outcome of a whole host of ways that inequality of incomes affects children" (Corak 2013, 7).

This argument is formalized in figure 1, which links parental education to offspring's earnings. The raw association between parental education and offspring earnings is the measure of intergenerational mobility used in this paper, henceforth labeled β_K (where K equals country). We estimate β_K across 24 countries using the following OLS regression model:[1]

$$Log(Y_{ij}^{Child}) = \alpha + \beta.E_{ij}^{parent} + \phi.C_{ij} + \varepsilon_{ij} \; \nabla \; \mathrm{K}, \tag{1}$$

where Y_{ij}^{Child} = Offspring earnings, E_{ij}^{parent} = Highest level of parental education, C = A vector of control variables (quadratic age, immigrant status), ε = Error term, i = Individual i, j = Cluster j (referring to the sample design, with respondents clustered within geographic units), and ∇ K = Refers to the same model being estimated separately in each country (K).

Parental education is the measure of social stratification used in our estimations of intergenerational mobility. This is in contrast to previous work on the GGC, where parental income has been preferred. We depart from this convention for both theoretical and data reasons. Regarding the latter, there is no cross-nationally comparable data set containing high-quality information on parental income across a large number of countries. This includes PIAAC, with parental education being the best available proxy. However, we argue that parental education may be preferable anyway, as it is likely to capture a broader array of parental inputs into children's development (Leibowitz 1977).[2] For instance, educated parents not only earn more ("financial resources"), but also have greater social and cultural capital ("nonfinancial resources"); see Bukodi and Goldthorpe (2012). Figure 1 illustrates how both influence children's educational attainment and labor-market outcomes, and that measures of social stratification should incorporate both. We maintain that parental education probably performs this function better than parental income.[3]

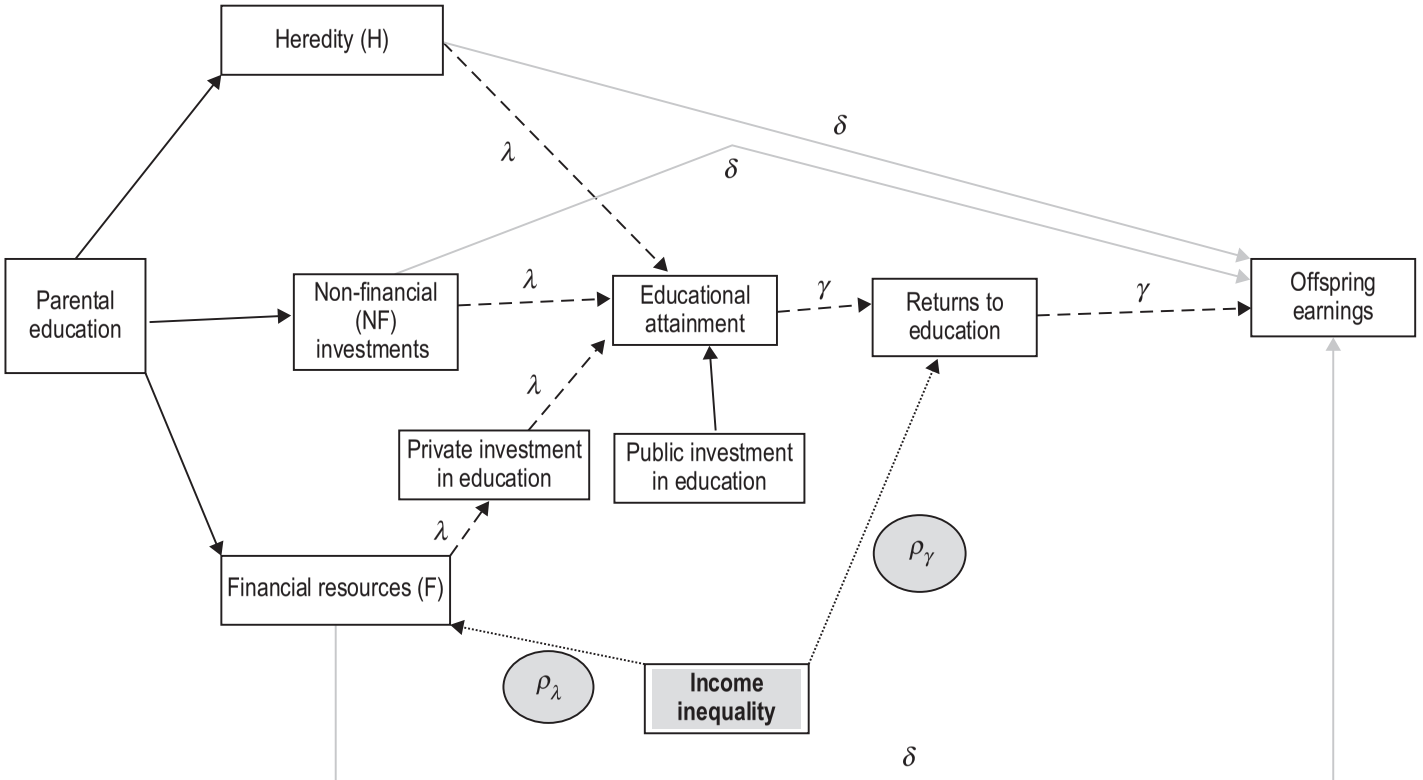
Figure 1 illustrates that the link between parental education and offspring's earnings can be separated into two components: the part working through offspring's educational attainment (dashed arrows) and the part that is not (solid gray arrows). (One may view this as an extension of the Origin – Education – Destination (OED) triangle that has a long tradition in social stratification research. See Breen [2004] and Goldthorpe [2013].) Formally, following Gregg et al. (2013), the intergenerational association (β) will be divided into the following parts:

$$\beta = \gamma.\lambda + \delta \tag{2}$$

where β = Total association between parental education and offspring's earnings; γ = Labor-market value of qualifications; λ = Relationship between parent and offspring's educational attainment; and δ = The (unexplained) residual influence of parental education on offspring's earnings.

$\gamma.\lambda$ represents the "through education" effect of parental education upon offspring's earnings; it is the part that *can* be accounted for by differences in educational attainment across offspring. The second component, the intergenerational

Figure 1. Income inequality and the intergenerational transmission of (dis)advantage



Note: H indicates a heredity pathway. NF indicates a nonfinancial pathway. F indicates a financial pathway. λ is the estimated link between parental education and offspring's educational attainment. γ is the estimated link between offspring's educational attainment and the returns to education. ρ_λ and ρ_γ refer to the correlation between these factors and income inequality.

correlation of education (λ), is itself determined by two factors (see Becker [1964]):

(i) Parental *capacity* to invest in their offspring's education. (This will be influenced by the dispersion of financial and nonfinancial resources in the country in which the parents live.)
(ii) Parental *incentives* to invest in their offspring's education. (This will be influenced by the parents' *perception* of the future returns to education, γ, when their offspring are adults.)

Unfortunately, it is not possible to estimate the separate effects of (i) and (ii) in our analysis, as both are likely to be influenced by income inequality at the same point in time.[4] However, to provide indicative evidence on this matter, we will discuss results from additional analysis investigating the link between family background and subject choice. (We argue that, while families' *capacity* to invest is unlikely to differ by subject, their *incentives* may due to large differences in economic returns.)

In contrast, δ is the *unexplained (residual)* effect; it is the association between parental education and offspring's earnings that remains after controlling educational attainment. We estimate the magnitude of each component across countries, and examine whether they are larger in more unequal societies. These components are further discussed below.

The Intergenerational Correlation of Education (λ)

λ represents the intergenerational correlation of education; the association between the educational attainment of parents (E_{ij}^{parent}) and offspring (E_{ij}^{child}). We investigate how λ varies across countries, and whether it is linked to income inequality (this hypothesised correlation with income inequality is denoted ρ_{λ}).

Figure 1 illustrates that three factors drive λ:

Heredity (H) = The genetic transfer of skills across generations
Nonfinancial resources (NF) = Nonfinancial inputs into children's development (e.g., reading stories, helping with homework).
Financial resources (F) = Monetary inputs into children's development (e.g., private tuition, school quality, tuition fees).

If λ does vary across countries, this is unlikely to be due to channel H; heredity transfers will not lead to stronger intergenerational associations in Britain than Australia (for example). Conversely, the distribution of NF resources may vary across countries; cultural and scholarly capital could be more evenly spread among the population in Sweden than the United States (for example). Although this would lead to cross-national variation in λ, it is not then clear why λ would be strongly associated with income inequality (though one cannot rule this possibility out).[5] Consequently, if an association between λ and income inequality does exist (i.e., $\rho_{\lambda} > 0$), then it is likely to work mainly through channel F (where a strong plausible mechanism is clear). Specifically, greater income inequality leads to greater disparity in financial resources between high and low parental education groups, which generates bigger differences in offspring's educational attainment.

Appendix C presents empirical evidence on this matter by exploring the relationship between income inequality and family background differences in financial and nonfinancial investments using the Programme for International Student Assessment (PISA). The cross-national correlation between income inequality and financial investments is strong (Spearman's rank = 0.73), while for nonfinancial investments it is relatively weak (Spearman's rank = 0.20). This is consistent with channel F driving any association between income inequality and the intergenerational correlation of education.

λ is estimated using the following OLS regression model, before being plotted against income inequality:

$$Ed_{ij}^{child} = \alpha + \lambda.E_{ij}^{parent} + \phi.C_{ij} + \varepsilon_{ij} \nabla \mathrm{K}. \quad (3)$$

The stronger the association (ρ_λ), the greater the evidence that access to financial resources (and, to a lesser extent, nonfinancial resources) matters in the intergenerational transmission of advantage.

The Returns on Education (γ)

There is likely to be a strong association between parent and offspring education (λ) due to financial, nonfinancial, and heredity factors. The impact upon offspring's earnings will depend, however, upon the value of qualifications in the labor market; that is, returns on education (γ). The product of λ^* γ hence determines the impact of offspring's education on intergenerational persistence (β). For instance, there may be strong parent-child education links within a country, but this may have little impact upon β if economic rewards to schooling are low.

Figure 1 illustrates our hypothesis that γ will be greater in more unequal countries. (We denote this correlation as ρ_γ) This is because financial rewards to more schooling are likely to be greater in societies where the income distribution is more dispersed. For example, university graduates will earn more, on average, than high school graduates in every country. But, with more inequality in the earnings distribution, the wage differential between graduates and non-graduates will be considerably larger. Similarly, wages are likely to be taxed and redistributed more in low-income-inequality countries, further reducing the private returns on education (relative to high-income-inequality countries).

Consequently, income inequality will have a double influence upon the "through education" component of the intergenerational transmission process; it will affect both the intergenerational correlation of education (λ) and the economic rewards of holding higher qualifications (γ). Becker (1964) suggests that this creates the perfect storm—more advantaged families have greater resources to invest in their children's education and greater incentives to do so in more unequal countries. This then leads to a pronounced relationship between income inequality and the "through education" component of β. We test this hypothesis in our analysis.

γ is estimated via model (4), capturing the link between offspring's education and their earnings, conditional upon parental education:

$$Log(Y_{ij}^{Child}) = \alpha + \delta.E_{ij}^{parent} + \gamma.Ed_{ij}^{child} + \phi.C_{ij} + \varepsilon_{ij} \nabla \text{K}. \quad (4)$$

Moreover, by rearranging equation (2) one can see that the combined "through education" effect ($\gamma.\lambda$) is the difference between the unconditional ($\hat{\beta}$) and conditional ($\hat{\delta}$) parameter estimates given by (1) and (4):

$$\gamma.\lambda = (\hat{\beta} - \hat{\delta}) = \textit{Through education effect}. \quad (5)$$

In our empirical analysis, we investigate whether ($\gamma.\lambda$) is linked to income inequality, before considering each subcomponent in turn.

School Systems and Public versus Private Investment in Education

There are a number of other important factors, beyond family-specific investments and behaviors, that could vary across countries and be associated with income inequality. Examples include residential income segregation and public expenditure on education. We argue that parental financial resources will be particularly important where such factors are not well aligned to the interests of disadvantaged groups (i.e., where segregation is high and public expenditure on education is low).

Focusing on public expenditure on schooling, for financial resources to be important in the intergenerational transmission process, parents must be able to gain an advantage for their offspring from using them (Lucas 2001). This will depend upon the design of the education system, including public resources invested. For instance, if all countries provided universal, high-quality, free public education, then private investment would be crowded out. Consequently, access to financial resources (and therefore income inequality) would be unlikely to matter. In other words, public investment can potentially compensate for a lack of private investment by disadvantaged families (see figure 1). Yet, education systems differ markedly in this respect. In some, the proportion of national wealth spent upon public education is large, while in others the private sector has a more prominent role.

We hypothesize that in high-inequality countries, public investment in education will be lower and private investments will be higher. In other words, there will be less scope for public education to "level the playing field" between the rich and poor. We test this by estimating the association between income inequality and the following factors:

- Expenditure on education as a percent of GDP
- Percent of pupils enrolled in private-independent schools
- Percent of pupils using a private out-of-school tutor
- Socio-economic differences in the probability of using a private out-of-school tutor
- Tertiary education tuition costs.

Residual Effects

Parental education may influence offspring's earnings in ways other than through educational attainment (solid gray arrows in figure 1). This is the "residual" effect (δ_K), which operates via three mechanisms. The first is financial resources. For instance, unpaid internships are becoming an important intermediate step between college and the labor market. High parental education families can use their greater financial resources to support their offspring during this transition, while low parental education families may not. Similarly, offspring from families with greater financial resources may have more time to find a suitable job than offspring from families with fewer resources. This will be a bigger problem in countries with greater differences in financial resources between parental education groups (i.e., those with more income inequality).

The second mechanism is through the use of social and cultural resources (Bourdieu 1986), including connections and networks in the labor market—that is, nonfinancial resources. For instance, highly educated parents may draw upon their networks to secure their offspring a well-paid job (Coleman 1990). Low-educated parents may be unable to provide their offspring with the same labor-market opportunities (even when their offspring hold the same qualifications). Moreover, although reasons why this would vary by income inequality are not as apparent as for the financial resources (F) channel, one cannot rule this possibility out (e.g., an anonymous referee has suggested residential segregation as one such possibility).

The final mechanism is heredity endowments. An example is looks or beauty. Such traits are passed across generations, do not operate through educational attainment, and have nontrivial labor-market rewards (see Hamermesh and Biddle [2001]). They will thus be incorporated in δ_K. Other examples might include personality, eloquence, the ability to read emotions, and other noncognitive skills that do not influence offspring's educational attainment (Jackson 2006). However, as with heredity transmission of skills, this process is unlikely to differ across countries (or be associated with income inequality).

We therefore argue that if there is a systematic association between δ_K and income inequality, this will largely be driven by channel F (access to financial resources). This would, in turn, suggest that access to financial resources is central to the intergenerational transmission process. Estimates of δ_K are drawn from equation (4). We examine whether these δ_K are greater in more unequal countries.

Data

Survey Design

PIAAC was conducted in 2011, and provides internationally comparable information on educational attainment and labor-market outcomes. Geographic regions were selected as the primary sampling units, with one 16-to-65-year-old within each household randomly chosen to participate (OECD 2013, chapter 14). Response rates ranged from 45 percent in Sweden to 75 percent in Korea (median equals 62 percent). The survey organizers undertook a thorough analysis of nonresponse (OECD 2013, chapter 16), finding that this problem was typically

"minimal" to "low" (see appendix table A1). To account for the complex survey design, response and replicate weights are applied throughout.

We restrict the sample to men aged between 25 and 59. Female respondents are excluded to maximize comparability with the existing literature (which has focused upon men) and the added complexity of labor-market selection for women.[6] Individuals younger than 25 and older than 59 have been excluded, as their earnings are subject to "transitory" fluctuations, leading to "life-cycle bias" (see Haider and Solon [2006]). Our analysis thus focuses upon men born between roughly 1950 and 1985, with estimates essentially an average for individuals born during this period. (We have reproduced all estimates for 35-to-55-year-old males only with little substantive change to results). Sample sizes range from 472 in Russia to 7,707 in Canada (with a median of 1,453); see online appendix table A1.

Parental Education

Respondents were asked about their parents' education. This is measured using International Standard Classification of Education (ISCED) levels; a schema designed to facilitate cross-national comparisons. Following much of the cross-national literature (e.g., the Luxemburg Income Study[7]), a collapsed version of ISCED is used:

- Low = Neither parent obtained upper secondary schooling
- Middle = At least one parent attained secondary and postsecondary, nontertiary education
- High = At least one parent attained tertiary education.

Estimates of intergenerational associations (β, λ, and δ) refer to differences between high and low parental education groups.

Our measure of parental education has limitations. For instance, its distribution differs across countries (see appendix table A2). We therefore perform various robustness tests, operationalizing parental education in different ways. Specifically, within each country, information on mother's education, father's education, and number of books at home (a common proxy for parental scholarly capital in cross-national research) is combined to create a continuous parental education index. This index has been standardized to mean 0 and standard deviation 1 within each country, and has the advantage of (i) combining information from an array of variables; (ii) having the same distribution within each country; and (iii) including information from throughout the parental education distribution. All results are reproduced using this alternative metric in online appendix D and E, while appendix F presents results where father's education only is used. There is little substantive change to the conclusions reached.

Earnings

Respondents' gross (pretax) labor-market earnings were collected via a battery of questions, designed to maximize the quality of reports while minimizing nonresponse. Earnings could be reported hourly, daily, weekly, bi-weekly, monthly, annually, or at a piece rate, with categories used where respondents were unwilling to provide exact amounts. Separate questions were asked about bonuses, and

to the self-employed. A gross (pretax) monthly earnings variable has then been derived by the OECD (OECD 2013, chapter 20.4), as follows:

(i) All information converted into a consistent reporting period (e.g., from hourly to yearly)
(ii) Categorical earnings converted into direct amounts
(iii) A Purchasing Power Parity (PPP) correction applied.

The natural logarithm of PPP-adjusted labor-market earnings is used, for all individuals either employed or self-employed. (The unemployed and labor-market inactive, whose earnings are unobserved, are excluded.)

Offspring's Educational Attainment

Detailed questions were asked about qualifications held. Country-specific options were provided, and converted into ISCED levels by the OECD. Measures of educational transitions are preferred to linear models of years of education due to changes in the marginal distribution of education, and the notion that educational attainment reflects a series of decisions (Breen and Jonsson 2005). The following categories are formed:

(a) Primary (ISCED level 1)
(b) Lower secondary (ISCED level 2 or 3c short)
(c) Upper secondary (ISCED level 3a, 3b, and 3c long)
(d) Postsecondary, nontertiary (ISCED level 4)
(e) Professional degree (ISCED level 5b)
(f) Bachelor's degree (ISCED 5a)
(g) Master's/research degree (ISCED 5a/6).

When decomposing the link between parental education and offspring's earnings into explained and residual components (recall equation 4), this seven-category schema is used. In contrast, categories are collapsed when estimating access to (λ) and returns from (γ) education, as follows:

(i) Upper secondary school and below (categories a to c above)
(ii) Postsecondary but below bachelor's degree (categories d to e above)
(iii) Bachelor's degree and above (categories f and g above).

(The distribution of this variable across countries is presented in appendix table A3.) This is to facilitate the production and presentation of results across a large number of countries. We consider the implications from using the seven-category versus three-category measure in appendix G.

Subject specialization may also play a role in the "through education" component of intergenerational mobility, as graduates majoring in certain disciplines earn higher wages (Black, Sanders, and Taylor 2003). If subject choice is also related to family background (e.g., by certain university disciplines requiring higher school grades), then this will be an important "through education" mechanism. Subject of highest qualification, using a nine-category grouping, is therefore also controlled (as part of Ed_{ij}^{child}).

Years of Education

A limitation of the offspring's educational attainment measure is that its distribution varies across countries (see appendix table A3). We therefore also measure the intergenerational correlation of education (λ) and returns (γ) using respondents' years of schooling. Specifically, respondents' education has been converted into a "years of schooling" equivalent using OECD (2005, 422),[8] and then standardized to mean 0 and standard deviation 1 *within* each country. There are two advantages of this approach. First, as years of schooling has been standardized, the spread is the same within each country. (All results therefore refer to differences in *national* standard deviations.) Second, as years of schooling is continuous, information is captured from throughout the educational achievement distribution (rather than just the extremes). This is therefore a useful alternative to test the robustness of our results.

Income Inequality

Income inequality is measured using the Gini coefficient. Although there are alternatives (e.g., Atkinson coefficient, decile ratios), similar GGC estimates are obtained regardless of the income inequality measure used (Blanden 2013). This information is drawn from the Luxemburg Income Study (LIS),[9] widely considered to be the "gold standard" in income inequality measurement across countries (Atkinson 2004) due to the consistency of population coverage, income concept (disposable household income), unit of analysis, and equivalence scales. However, for most countries, data are available only from around 1980 onward.

This leads to an important question: At what point should income inequality be measured? In theory, inequality during childhood should be particularly important for the part of mobility working through the intergenerational correlation of education. In contrast, present-day inequality should be a more important predictor of the returns to education. Consequently, inequality throughout the life course should influence the intergenerational transmission of advantage. With this in mind, our primary measure of income inequality is the average Gini coefficient across all available LIS waves.

Alternative information on income inequality is available from the Standardized World Income Inequality Dataset, SWIID.[10] This contains income inequality data for more countries than the LIS, and over a longer time period (1960 to 2010 for most of the OECD). However, it also has lower levels of cross-national comparability (Atkinson and Brandolini 2001), particularly for years prior to 1980.

Nevertheless, we use this alternative data set to test the robustness of our results. First, we average the Gini coefficient across all available years between 1965 and 2010, and find little change to the conclusions reached. Second, measures of "childhood" inequality (average Gini coefficient between 1965 and 1985) and present-day inequality (average Gini coefficient between 2005 and 2011) are created, and correlated with β, γ, λ, and δ. Moderate to strong associations are typically found for each of the above, regardless of the income inequality measure used. However, although we find support for the hypothesis that the returns on education are more strongly associated with present-day inequality than childhood

inequality ($r = 0.59$ versus $r = 0.39$), the opposite does not seem to hold true for the intergenerational correlation of education ($r = 0.55$ versus $r = 0.64$).[11]

Country Selection

Twenty-two OECD and two non-OECD (Russia and Cyprus) countries participated in PIAAC. However, as Andrews and Leigh (2009) argue, "it may be unreasonable to draw a link between [income] inequality … and intergenerational mobility" for "transition" economies previously under Communist rule. In particular, recall that the sample includes men born between 1950 and 1985, when these countries did not have a market economy. Individuals in these countries would have also experienced substantial economic, social, and political change, with such instability potentially leading to unusual and unpredictable patterns of social mobility. Consequently, it has been argued that these countries are unlikely to demonstrate the hypothesized link between income inequality and intergenerational mobility, and should therefore be excluded from the GGC (Andrews and Leigh 2009).

This complication will be handled as follows. The GGC will first be reproduced using parental education–offspring earnings estimates from 23 of the 24 PIAAC countries (Cyprus is excluded due to a lack of income inequality data within the LIS). The sensitivity of our version of the GGC to the inclusion/exclusion of the five transition economies (Russia, Poland, Estonia, Czech Republic, and the Slovak Republic) is then illustrated. Subsequent decompositions will be presented for all countries, with the transition economies only excluded from our graphical representations of how the different components of the intergenerational association (γ, λ, and δ) vary with income inequality.

Results

Does the Great Gatsby Curve Really Exist?

Table 1 presents estimates of the link between parental education and labor-market earnings (β). In all countries there is a strong and statistically significant association, with individuals from low parental education backgrounds earning up to 75 percent less than those from high parental education backgrounds. However, the strength of this association varies across countries. Finland, Sweden, Norway, and Denmark are all toward the bottom of table 1, where the parental education–offspring earnings gap is approximately 20 percent or less. On the other hand, the equivalent difference in the Slovak Republic and United States is more than 70 percent. Overall, the ranking of countries in table 1 is broadly similar to Blanden (2013, table 2) and Corak (2012), who perform a similar cross-country comparison using an alternative measure of social mobility (the link between the income of fathers and sons). Indeed, the correlation between our estimates in table 1 and Blanden (2013, table 2) is 0.73 (rank-order correlation 0.75). Similarly, the correlation between our mobility estimates and those of Corak (2012) equals 0.79 (rank order 0.83).

Figure 2 plots these β coefficients against income inequality. (See online appendix table A1 for the key to country abbreviations.) The left-hand panel includes

Table 1. The Estimated Difference in Earnings between Individuals from "Low" and "High" Parental Education Backgrounds

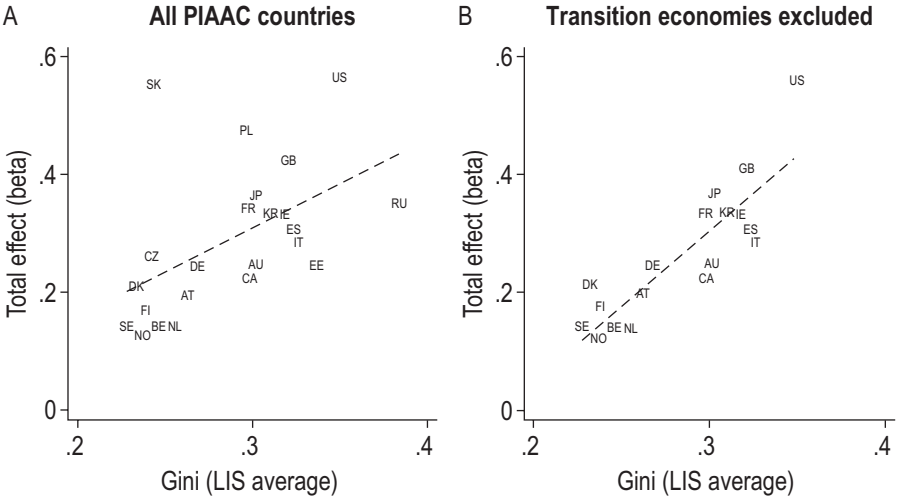
	β	SE	% difference [exp(β)]
USA	0.56	0.09	75
Slovak Republic	0.55	0.10	74
Poland	0.47	0.10	61
UK	0.42	0.07	51
Japan	0.37	0.06	44
Russia	0.35	0.23	42
France	0.33	0.04	40
South Korea	0.33	0.05	40
Ireland	0.33	0.07	39
Spain	0.30	0.13	35
Italy	0.28	0.18	33
Czech Republic	0.26	0.06	30
Australia	0.25	0.05	28
Estonia	0.25	0.06	28
Germany	0.24	0.08	27
Canada	0.22	0.04	25
Denmark	0.21	0.06	24
Austria	0.20	0.07	22
Finland	0.17	0.05	19
Sweden	0.14	0.04	15
Netherlands	0.14	0.04	15
Belgium	0.14	0.04	15
Norway	0.12	0.05	13

Note: Authors' estimates using the PIAAC data set. Figures refer to the earnings differential between individuals from advantaged (high parental education) and disadvantaged (low parental education) backgrounds. SE refers to the standard error.

all countries. Although we find a link between income inequality and mobility, this association is relatively weak. The correlation coefficient equals 0.39 (Spearman's rank 0.49)—notably less than the 0.85 reported by Krugman (2012) and the 0.60 by Blanden (2013). Similarly, the fitted regression line suggests that a 0.10 increase in the Gini coefficient (roughly the difference in income inequality between Sweden and the UK) is associated with a relatively small (0.11) increase in β. Nevertheless, this association does reach statistical significance at conventional thresholds.

However, as discussed above, the hypothesized link between income inequality and intergenerational mobility is unlikely to hold in the transitional economies of Russia, Poland, Czech Republic, Estonia, and the Slovak Republic, where there was substantial social, economic, and political change during the late 20th

Figure 2. Income inequality and the link between family background and labor-market earnings



Note: Authors' calculations using the PIAAC data set. Left-hand panel includes all countries with data available (Pearson correlation = 0.39; Spearman's rank = 0.49). Right-hand panel excludes transition economies (Pearson correlation = 0.86; Spearman's rank = 0.81). See appendix table A1 for country codes.

century. Moreover, these countries have a big impact upon the results presented in the left-hand panel of figure 2, and are thus excluded in the panel on the right. Consistent with Andrews and Leigh (2009), the association between income inequality and intergenerational mobility becomes significantly stronger. The correlation coefficient increases to 0.86 (Spearman's rank = 0.81), with a 0.10 increase in the Gini now associated with a 0.26 increase in β. These magnitudes are consistent with Corak (2012) and Blanden (2013), neither of whom included transition economies in their versions of the GGC. Together, this provides strong evidence that income inequality is indeed linked to intergenerational mobility (at the cross-national level) when alternative and comparable measures of parental background are used.

To What Extent Does Educational Attainment Mediate the Link between Parental Education and Labor-Market Outcomes?

Table 2 decomposes β into the part that works through offspring's educational attainment ($\gamma.\lambda$) and the residual component (δ). Educational attainment is an important mediating factor; in all countries, $\gamma.\lambda$ accounts for more than half of the total effect (β). This illustrates education's important role in the intergenerational transmission of (dis)advantage. Indeed, in several countries, δ (the residual) is small and statistically insignificant, including Denmark, Finland, Norway, Sweden, Austria, Germany, Belgium, and the Netherlands. Hence, conditional upon educational achievement, parental education has little additional impact upon offspring's earnings. In contrast, the residual effect of parental education (δ) is

Table 2. Decomposition of the Intergenerational Association into the "Through Education" and "Residual" Effect of Parental Education on Offspring's Labor-Market Earnings

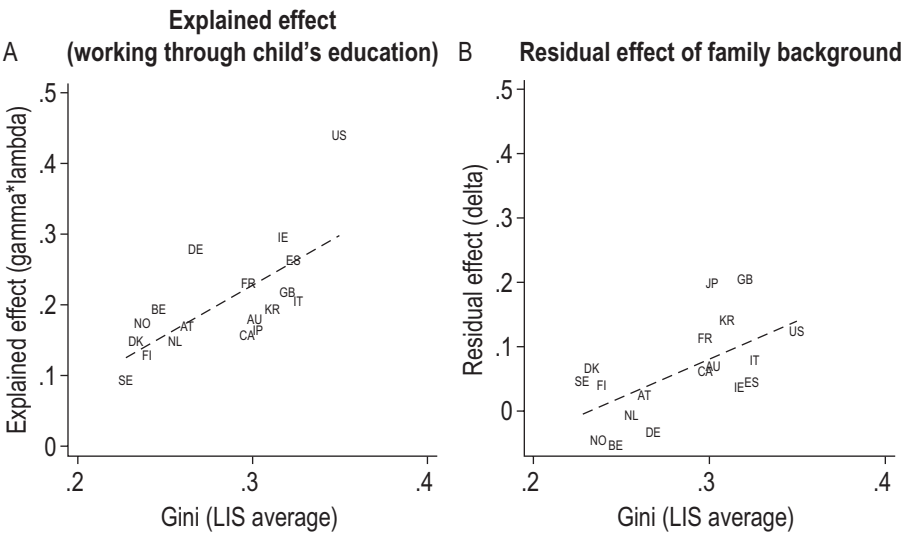
	Total (β)		Through ed (γ*λ)		Residual (δ)	
	β	SE	γ*λ	SE	δ	SE
Russia	0.35	0.23	0.08	0.11	0.27	0.14
Slovak Republic	0.55	0.10	0.35	0.07	0.21	0.13
Japan	0.37	0.06	0.17	0.03	0.20	0.06
UK	0.42	0.07	0.22	0.04	0.21	0.07
Korea	0.33	0.05	0.19	0.02	0.14	0.05
USA	0.56	0.09	0.44	0.05	0.12	0.08
France	0.33	0.04	0.23	0.03	0.11	0.04
Estonia	0.25	0.06	0.14	0.02	0.10	0.06
Poland	0.47	0.10	0.38	0.05	0.10	0.10
Italy	0.28	0.18	0.21	0.07	0.08	0.18
Australia	0.25	0.05	0.18	0.02	0.07	0.05
Canada	0.22	0.04	0.16	0.02	0.06	0.04
Denmark	0.21	0.06	0.15	0.02	0.06	0.06
Sweden	0.14	0.04	0.09	0.01	0.05	0.04
Spain	0.30	0.13	0.27	0.03	0.04	0.14
Ireland	0.33	0.07	0.30	0.04	0.04	0.06
Finland	0.17	0.05	0.13	0.02	0.04	0.05
Austria	0.20	0.07	0.17	0.04	0.03	0.08
Netherlands	0.14	0.04	0.15	0.03	0.00	0.05
Czech Republic	0.26	0.06	0.27	0.05	0.00	0.08
Germany	0.24	0.08	0.28	0.04	–0.03	0.07
Belgium	0.14	0.04	0.20	0.02	–0.05	0.05
Norway	0.12	0.05	0.17	0.03	–0.05	0.06

Note: Authors' estimates using the PIAAC data set. The left-hand columns provide the total earnings differential between individuals from advantaged (high parental education) and disadvantaged (low parental education) backgrounds. The right-hand columns provide the analogous earnings differential after the offspring's own educational attainment has been controlled (the "residual" effect). The middle columns give the difference between the two (the "through education" effect).

substantial in France, Japan, South Korea, and the UK, where the low parental education group earns 20 percent less than the high parental education group, even when they hold the same level of qualification in the same subject area. To test the robustness of these results, we have re-estimated the decomposition using respondents' standardized years of education (rather than qualification level). There was little change to the substantive results reported above.

Figure 3 considers whether offspring's educational attainment may be driving our version of the GGC. The association between income inequality and $\gamma.\lambda$

Figure 3. A decomposition of the Great Gatsby Curve



Note: The left-hand panel illustrates the relationship between income inequality and the *explained effect* of parental education on offspring income (i.e., the part that works through offspring's education attainment). Pearson correlation equals 0.70. Right-hand panel illustrates the relationship between income inequality and the *residual effect* of parental education on offspring income (i.e., net of the offspring's educational attainment). Pearson correlation equals 0.60.

(the "through education" component of β) is presented in panel (a) with analogous results for δ (the "residual" component) in panel (b).

There is a strong and statistically significant association in panel (a); the correlation coefficient equals 0.70 (Spearman's rank = 0.62), with a 0.10 increase in the Gini coefficient associated with a 0.13 increase in γ*λ. This is consistent with the theoretical model presented in figure 1; the link between income inequality and educational attainment is a key driver of our version of the GGC. Yet, there is also a reasonably strong association in panel (b) (Pearson correlation = 0.67, Spearman's rank = 0.63, $p = 0.01$), with the *residual* effect (δ) increasing by 0.12 for each 0.10 increase in the Gini coefficient. Again, very similar findings held using respondents' years of education rather than qualification level.

Is the "Through Education" Component of the GGC Driven by Socio-Economic Inequality in Educational Attainment or the Returns to Education?

As noted above, the "through education" component comprises:

(i) The intergenerational correlation of educational attainment (λ)
(ii) The labor-market returns to qualifications (γ).

We now consider whether λ and γ are greater in more unequal countries.Table 3 presents differences between low and high parental education groups in terms of

Table 3. Socio-Economic Differences in University Graduation Rates and Years of Schooling (λ)

	University access		Years of schooling	
	Percentage-point difference	Standard error	Effect size	Standard error
Czech Republic	57.1	4.1	1.57	0.11
Slovak Republic	57.0	3.8	1.48	0.13
Poland	55.2	4.4	1.34	0.11
Italy	51.5	4.9	1.43	0.18
Russia	49.9	3.9	0.93	0.15
United States	46.0	2.5	1.24	0.08
Spain	45.6	3.5	1.02	0.06
Japan	44.1	3.4	1.02	0.07
France	43.0	2.8	0.98	0.07
United Kingdom	42.7	4.2	1.05	0.10
Norway	36.9	2.6	0.91	0.06
Korea	36.2	3.6	0.78	0.06
Netherlands	36.1	3.1	0.78	0.07
Australia	34.5	2.4	0.86	0.05
Germany	34.0	3.4	1.00	0.12
Estonia	33.9	2.2	0.85	0.07
Ireland	33.3	3.1	0.89	0.07
Belgium	32.7	2.6	0.99	0.06
Austria	29.4	2.7	0.99	0.09
Finland	28.8	3.4	0.81	0.08
Canada	28.3	2.2	0.80	0.05
Denmark	23.9	2.3	0.81	0.06
Sweden	23.7	2.5	0.66	0.06

Note: Authors' calculations using the PIAAC data set. Left-hand columns provide the estimated percentage-point difference in holding a bachelor's degree between individuals from high and low parental education backgrounds. The right-hand columns are the difference in years of schooling between individuals from high and low parental education backgrounds, expressed as an effect size (national standard-deviation differences).

(i) obtaining a bachelor's degree and (ii) standardized years of schooling. These are our measures of λ.

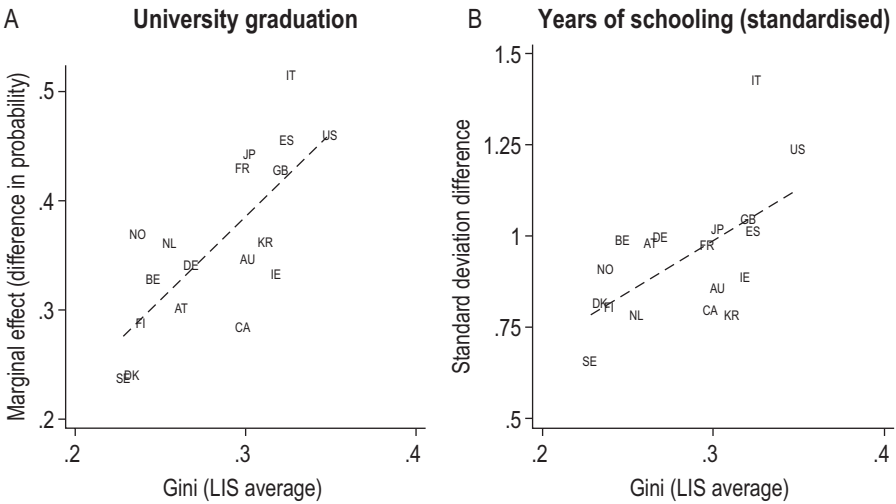
Differences by parental education in offspring's educational attainment are large and significantly significant in all countries, though there is also substantial cross-national variation. Gaps are comparatively small in Scandinavia; individuals from low parental education backgrounds are 24 percentage points less likely to graduate from university than individuals from high parental education backgrounds in Sweden, for example. On the other hand, there is a 50-percentage-point difference in the probability of university graduation in the transition

economies (the Slovak Republic, Czech Republic, Poland, and Russia). Elsewhere, parental education differences in university graduation are comparatively large in Italy, Japan, and the United States (approximately 45-to-50-percentage-point gaps) relative to Austria and Canada (25-to-30-percentage-point gaps). In additional analysis, we explored the association between parental education and subject specialism, and found only a weak link in most countries.

Figure 4 plots these estimates of λ against income inequality, with university graduation results in panel (a) and standardized years of schooling in panel (b). A reasonably strong and statistically significant association is observed in both. The Pearson correlation equals 0.74 in panel (a) (Spearman's rank = 0.74), where there is a 15-percentage-point increase in the difference between low and high parental education groups graduating from university for each 0.10 increase in the Gini coefficient. Although the correlation is weaker in panel (b) (Pearson = 0.59, Spearman = 0.62, $p = 0.01$), a 0.10 increase in the Gini coefficient is still associated with a 0.28-standard-deviation increase in the low–high parental education gap in years of schooling.

This provides indicative evidence that access to financial resources matters in the intergenerational transmission process. Disparities in financial resources by parental education group are greater in more unequal countries, translating into bigger differences in families' ability to invest in their offspring's education. Moreover, as discussed above, heredity transfers are unlikely to vary across countries, while nonfinancial resources are unlikely to be strongly associated with the level of income inequality in society (see appendix C for empirical evidence on this matter). Consequently, it is the financial resource component of parental

Figure 4. Income inequality and the socio-economic gradient in educational attainment



Note: The left-hand panel illustrates the relationship between income inequality and the high-low parental education gap in holding a bachelor's degree. Pearson correlation equals 0.74. The right-hand panel illustrates the relationship between income inequality and the estimated high-low parental education gap in respondents' years of education (standardized within country). Pearson correlation equals 0.59. See appendix table A1 for country codes.

education that is the most credible explanation as to why λ is positively associated with income inequality. Further, as subject choice is only weakly associated with parental education in most countries (despite well-known differences in economic returns), differences in families' *capacity* to invest (rather than the *incentives*) seem the more likely driving force.

Table 4 examines financial returns to education (γ). The left-hand side presents the earnings differential between university and high school graduates, while the

Table 4. The Wage Returns to University Qualifications (γ) and Standardized Years of Schooling

	University degree			Years of schooling		
	γ	SE	% difference [exp(γ)]	γ	SE	% difference [exp(γ)]
USA	0.73	0.07	107	0.34	0.03	41
Ireland	0.63	0.07	88	0.32	0.03	37
Germany	0.57	0.06	76	0.25	0.02	28
Poland	0.52	0.05	68	0.25	0.02	28
Slovak Republic	0.50	0.09	64	0.22	0.04	25
Belgium	0.48	0.04	62	0.19	0.02	21
UK	0.47	0.05	61	0.21	0.03	24
Spain	0.47	0.06	60	0.19	0.02	21
Korea	0.45	0.05	58	0.20	0.02	22
Canada	0.45	0.04	57	0.19	0.02	21
Austria	0.45	0.06	56	0.17	0.02	18
France	0.44	0.04	55	0.19	0.02	21
Australia	0.43	0.04	54	0.20	0.02	22
Czech Republic	0.41	0.07	51	0.16	0.03	18
Netherlands	0.41	0.07	51	0.20	0.03	22
Finland	0.39	0.03	47	0.16	0.02	17
Norway	0.38	0.05	47	0.20	0.03	22
Denmark	0.37	0.05	45	0.17	0.02	19
Russia	0.36	0.34	43	0.03	0.04	3
Japan	0.35	0.05	42	0.18	0.02	19
Estonia	0.35	0.05	41	0.15	0.02	17
Sweden	0.33	0.03	38	0.14	0.01	15
Italy	0.24	0.07	27	0.12	0.02	13

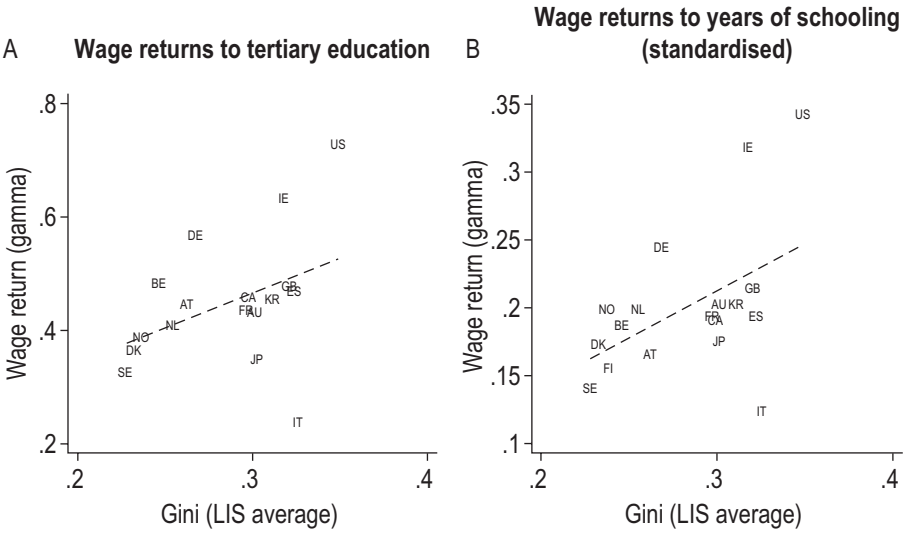
Note: Authors' calculations using the PIAAC data set. "University degree" results refer to the difference in earnings between individuals holding a university degree relative to high school education or below. "Years of schooling" results refer to the wage return per each national standard-deviation increase in years of schooling. The left-hand-most figures refer to the estimated regression coefficients, while the right-hand column converts these into percentage differences. SE column provides the standard errors.

right-hand side illustrates the change in respondents' wages for each national standard-deviation increase in years of schooling.

Wage returns are particularly high in the United States, where university graduates earn, on average, double the amount of high school graduates ($\gamma = 0.73$; $\exp(\gamma) = 1.07$). Returns are also high in Canada, Belgium, Ireland, Germany, and the UK, where the graduate wage premium is approximately 60 percent or more. In contrast, there is just a 27 percent wage differential in Italy, 38 percent in Sweden, and 42 percent in Japan. The Scandinavian countries are all within the bottom half of the table (comparatively low returns on tertiary education). A broadly similar pattern holds when considering returns on additional years of schooling, with high returns in the United States, Germany, and Ireland, and lower returns in Sweden, Finland, Italy, and Belgium.

Figure 5, panel A, illustrates the link between the returns on tertiary education and income inequality. Although there is an association (Pearson = 0.42, Spearman = 0.42, $p = 0.10$), a small number of countries have a big influence upon this result; the exclusion of Italy substantially increases the observed correlation (Pearson = 0.63), while the deletion of the United States dramatically reduces it (Pearson = 0.22). Indeed, the association actually turns negative with the removal of just three data points (Sweden, Ireland, and the United States). Figure 5, panel B, presents analogous results for the association between income inequality and the returns to additional years of schooling. There is a sign of a moderate correlation (Pearson = 0.49), which remains stable if Ireland, Italy, and the United States are

Figure 5. Income inequality and the returns to education



Note: Authors' calculations using PIAAC data set. Left-hand panel presents the percentage difference in wages between individuals holding a bachelor's degree versus those with only postsecondary education. Correlation coefficient = 0.42 (0.63 when Italy excluded and 0.22 when United States excluded). Right-hand panel presents results for a one-standard-deviation increase in years of schooling. Correlation = 0.49 (0.51 with Italy, Ireland, and US excluded). See appendix table 1 for country codes.

excluded as outliers (Pearson = 0.51). Nevertheless, the correlation between income inequality and wage returns (γ) seems to be slightly weaker than the correlation between income inequality and the intergeneration correlation of education (λ).

The Link between Income Inequality and Educational Systems

We now examine the hypothesis that public expenditure on education is lower, and private investments made by families higher, in more unequal countries. Specifically, we estimate the association between income inequality and the following five factors:

- Expenditure on education as a percent of GDP
- Percent of pupils enrolled in private-independent schools
- Percent of pupils using a private out-of-school tutor
- Socio-economic differences in the probability of using a private out-of-school tutor
- Tertiary education tuition costs.

Unfortunately, historical information for most of the above is not available (or has not been collected in a comparable manner). Our empirical analysis therefore focuses upon how income inequality is linked to "present-day" (post-2000) differences in these aspects of educational systems. Pearson and Spearman correlations are presented in table 5.

More economically unequal countries tend to spend a lower proportion of national wealth on education ($r = -0.50$; $p = 0.04$). In contrast, they have a greater proportion of children attending a private school ($r = 0.49$; $p = 0.06$) or using out-of-school private tutors ($r = 0.67$; $p < 0.01$). Moreover, the socio-economic gap in use of private tutors is also related to income inequality ($r = 0.59$; $p = 0.02$). Finally, there is a particularly prominent relationship between income inequality and university tuition fees ($r = 0.73$; $p < 0.01$). For instance, whereas average annual tuition fees are above $US 6,000 per annum (PPP adjusted) in high-income-inequality countries like Ireland, the United States, and Japan, they are below $2,000 per annum in lower income inequality countries like Austria, the Netherlands, Germany, Sweden, and Denmark.[12] These findings illustrate how income inequality is linked to public and private investments made in education, and how public schooling systems have less scope to level the playing field between rich and poor when the income distribution is relatively dispersed.

Conclusions

Income inequality is high and rising in a number of developed countries. Both academics and policymakers fear that this may have negative implications for future rates of social mobility. Much of this concern stems from the Great Gatsby Curve, which illustrates how economically unequal countries also tend to be the least socially mobile. However, due to variation across countries in data quality and methods used, concerns have been raised regarding the robustness of the GGC relationship (Jäntti and Jenkins 2013). Moreover, if the GGC does exist,

Table 5. The Correlation between Income Inequality and Key Educational Inputs

Variable	Source	Year	# of countries	Pearson correlation	Spearman correlation
Education expenditure as a percent of GDP	UN	1975	18	–0.50**	–0.58**
Percent of secondary school pupils enrolled in private school	PISA 2009	2009	16	0.49*	0.70**
Percent of pupils who have received out-of-school tutoring	PISA 2000	2000	16	0.67**	0.63**
Parental education differences in the percent of pupils receiving out-of-school tutoring	PISA 2000	2000	16	0.59**	0.71**
University tuition costs	EAG 2013	2011	18	0.73**	0.77**

Note: Authors' calculations. * and ** indicate statistical significance at the 10 percent and 5 percent level, respectively. EAG = Education at a Glance. UN = United Nations. PISA = Programme for International Student Assessment.

what are the mechanisms underpinning it? Little is currently known about this important issue, including the potential role of educational attainment.

The original contribution of this paper is hence twofold. First, we have attempted to replicate the GGC using cross-nationally comparable data and an alternative definition of intergenerational mobility. Second, we have empirically investigated the potential mediating role of educational attainment in the relationship between income inequality and intergenerational mobility for the first time. Our results have pointed toward the following six key results:

(i) The GGC can be replicated using alternative measures of intergenerational mobility and cross-nationally comparable data. The strength of the association depends, however, upon whether transition economies are included.
(ii) In all countries, it is educational attainment that is driving the link between parental education and offspring's earnings.
(iii) There is a strong association between income inequality and both the explained and residual effect of parental education on offspring's earnings.
(iv) Although income inequality is associated with both access to education and its financial returns, the strength of the relationship seems to be greater for the former than the latter. This suggests that the intergenerational correlation of education may be the more important driver of the link between income inequality and the "through education" component of β.
(v) The fact that the association between parental education, offspring's education, and offspring's earnings varies by income inequality suggests that financial resources play an important role in the intergenerational transmission of advantage.
(vi) High-inequality countries have more private investment in education and less public investment. This further emphasizes the important role of financial resources in the transmission of advantage in countries with greater inequality.

These findings have important implications for both academic understanding of intergenerational mobility and contemporary public policy. While some have questioned the importance of financial resources in the intergenerational transmission process (Mayer 1997), others believe this factor to be key (Becker 1964). In this paper, we have argued that families with greater financial resources have (a) greater *capacity* to invest in their offspring's development; and (b) greater *incentive* to invest when economic returns to education are high. Consequently, if financial resources are indeed an important driver of the intergenerational transmission of advantage, a strong relationship should be observed between income inequality and the "through education" component of intergenerational mobility. Our analysis suggests that although both financial and nonfinancial resources are likely to be important in the intergenerational transmission of advantage, the former is likely to be the dominant reason why income inequality is linked to mobility. This finding may arguably be driven more by differences between families' *capacity* to invest in education rather than their *incentives*, given the relatively weak link between parental education and subject specialism observed in most countries. Thus, ensuring that families have adequate access to financial resources, potentially through condensing the income distribution, may be pivotal in ensuring that young people have equal opportunities to succeed.

These findings should, of course, be considered in light of the limitations of our study. First, we remind readers that it is only currently possible to examine *associations* between income inequality and intergenerational mobility, rather than producing causal estimates. Second, one cannot rule out the possibility that different findings would emerge if parental occupation were used to measure social origin and destination (rather than education and earnings), due to well-documented cross-national differences between earnings and social class mobility (Blanden 2013). Third, the number of countries with high-quality income inequality and intergenerational mobility data remains restricted. Indeed, our analysis is based upon the experiences of 23 countries (18 when transition economies are excluded), meaning that statistical power is limited. Finally, due to the above, it has only been possible to perform cross-sectional analyses. Yet, a longitudinal study, investigating whether *change* in income inequality across countries is associated with *change* in rates of social mobility, would provide stronger evidence as to whether there is indeed a causal relationship between the two. However, although these are clearly important directions for future research, they will become possible only when new data are made available.

Thus, while we stress that our results refer to *associations* only, they nevertheless suggest that educational inequality is likely to be a key factor mediating the link between income inequality and intergenerational mobility. Likewise, our findings highlight how parental access to financial resources is likely to play a key role in the intergenerational transmission of social advantage. Policies focused on the redistribution of financial resources, and on minimizing educational disparities between rich and poor, are therefore likely to be vital in ensuring that the next generation has equal opportunities to succeed.

Notes

1. The β coefficients will occasionally be presented in percentage differences, calculated as $\{(\exp(\hat{\beta}) - 1) \times 100\}$.
2. While we acknowledge that parental education alone may not capture all domains of social origin, we are restricted by data availability. See Bukodi and Goldthorpe (2012) for a discussion of the relative merits of social class, status, and education as predictors of educational attainment.
3. Appendix B illustrates how results for the United States and UK would change were parental income used.
4. Income inequality *during childhood* is clearly the most relevant time point to consider family background differences in parental capacity to invest. However, income inequality during the offspring's childhood may also be relevant for parental incentives. For instance, parental *perceptions* of the returns to education will influence their decision of whether to invest in their children's education (which will be influenced by the income inequality they observe when their children are growing up). Consequently, the association between income inequality and parental capacity to invest, and between income inequality and parental incentives to invest, are confounded.
5. One possibility is that greater income inequality means greater returns to education, providing high-education families with greater incentive to make NF investments in their children.
6. We have re-estimated all models for women (see appendix I). The key conclusions reached continue to hold, though the observed Great Gatsby association (excluding transition countries) is slightly weaker than for men (correlation = 0.62). Moreover, the link between income inequality and the residual effect (δ) is weaker for women (correlation = 0.32) than for men (correlation = 0.67).
7. See http://www.lisdatacenter.org/.
8. Although imputed years of schooling is provided, our investigations suggest that a different approach has been taken in different countries. Thus, for cross-national comparability, we have preferred to create a new measure using a consistent methodology.
9. http://www.lisdatacenter.org/data-access/key-figures/inequality-and-poverty/.
10. http://myweb.uiowa.edu/fsolt/swiid/swiid.html.
11. The childhood income inequality measure predates the LIS, and so is low quality and lacks cross-national comparability. This could attenuate the link between childhood income inequality and intergenerational associations (including λ). In contrast, measures of present-day inequality are of higher quality, and have a greater degree of international comparability (and thus are unlikely to be subject to the same downward inconsistency).
12. Fewer cross-country data are available on post-schooling factors, including unpaid internships and parental support during job search. However, Bingley, Corak, and Westergård-Nielsen (2011) suggest that fathers and sons are more likely to have had the same employer in Canada (a moderate-income-inequality country) than Denmark (a low-inequality country).

Supplementary Material

Supplementary material is available at *Social Forces* online, http://sf.oxfordjournals.org/.

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