



JRC TECHNICAL REPORTS

A Review of Intergenerational Mobility and its Drivers

Jan Stuhler

Federico Biagi (ed.)

2018

This publication is a Technical report by the Joint Research Centre (JRC), the European Commission's science and knowledge service. It aims to provide evidence-based scientific support to the European policymaking process. The scientific output expressed does not imply a policy position of the European Commission. Neither the European Commission nor any person acting on behalf of the Commission is responsible for the use that might be made of this publication.

Contact information

Name: Jan Stuhler
Address: Calle Madrid 126, 28904 Getafe (Madrid)
E-mail: jstuhler@eco.uc3m.es
Tel.: +34 91 624 9678

JRC Science Hub

<https://ec.europa.eu/jrc>

JRC112247

EUR 29366 EN

PDF ISBN 978-92-79-94138-2 ISSN 1831-9424 doi:10.2760/610312

Luxembourg: Publications Office of the European Union, 2018

© European Union, 2018

The reuse policy of the European Commission is implemented by Commission Decision 2011/833/EU of 12 December 2011 on the reuse of Commission documents (OJ L 330, 14.12.2011, p. 39). Reuse is authorised, provided the source of the document is acknowledged and its original meaning or message is not distorted. The European Commission shall not be liable for any consequence stemming from the reuse. For any use or reproduction of photos or other material that is not owned by the EU, permission must be sought directly from the copyright holders.

All content © European Union 2018, except Cover image Fotoschlick, ©Fotolia, 2018.

How to cite: Stuhler J. A Review of Intergenerational Mobility and its Drivers, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-94138-2, doi:10.2760/610312, JRC112247.

Contents

Acknowledgments	4
Abstract	5
Executive Summary	6
1. Measuring Intergenerational Mobility and its Drivers	8
2. Measuring Intergenerational Mobility	11
2.1 Income Mobility	12
2.2 Educational Mobility	13
2.3 Occupational and Class Mobility.....	14
2.4 Multigenerational and Horizontal Measures.....	15
2.5 Pathways of Intergenerational Transmission.....	16
3. Intergenerational Mobility in Europe	17
3.1 Comparing Intergenerational Mobility across Countries.....	17
3.2 Spatial Variation within Countries.....	21
3.3 Trends in Intergenerational Mobility over Time.....	21
3.4 Inequality and Intergenerational Mobility	23
4 Causal Evidence	23
4.1 Neighbourhoods, Schools and Segregation.....	24
4.2 Early Childhood and Childcare.....	25
4.3 Educational Systems and Early Track-Choice.....	26
4.4 Private, Public Education and Credit Constraints	26
4.5 Informational Frictions and Beliefs	27
5 Data and Data Limitations	28
5.1 Measuring Child and Parent Outcomes	28
5.2 Administrative Data Sources.....	29
6 Conclusions and Outlook	32
References	35

Acknowledgments

I am grateful for many helpful comments and advice from Federico Biagi, Zsuzsa Blaskó, and Alejandro Fiorito.

Abstract

This report reviews evidence on intergenerational mobility and the transmission of socio-economic advantages from parents to children. The review examines conceptual questions on how to measure intergenerational mobility, empirical evidence on both descriptive and causal questions, and the data requirements that mobility research faces. The extent of income mobility varies substantially between countries, and appears negatively correlated with income inequality both across and within countries. For this reason, there is particular interest on mobility trends over time in those countries where income inequality has recently been increasing. However, the evidence for mobility trends in more recent cohorts is as yet less conclusive. Descriptive associations can only be suggestive of causal links, and the report also reviews evidence from more targeted research designs on the importance of (i) neighbourhoods and schools, (ii) early childhood and childcare, (iii) educational systems and track choice, (iv) private and public education, and (v) informational frictions and beliefs. The evidence demonstrates that educational policies can affect intergenerational mobility. An important trend in these and other literatures is the increasing use of administrative data sources, such as social security or tax data. The review discusses important hurdles in their adoption for mobility research, and points to data initiatives that could improve our understanding of intergenerational processes in the future.

Executive Summary

This report reviews evidence on *intergenerational mobility* and the transmission of socio-economic advantages from parents to children. The report examines conceptual questions on how to measure intergenerational mobility, empirical evidence on both descriptive and causal questions, and the data requirements that this literature faces.

The aim is not to provide an exhaustive account, but to present an up-to-date overview of policy-relevant strands of research, with a focus on educational systems. Educational attainment appears central in the intergenerational transmission process, and is closely related to socio-economic outcomes such as income or occupational success. It is also more closely linked, and potentially more amenable to policy than other transmission channels. Educational systems are therefore seen as one of the primary tools to affect mobility, and educational reforms are sometimes explicitly motivated from this perspective.

The first part of the report discusses how mobility can be measured. The estimation of intergenerational associations is data intensive, requiring reliable information on socio-economic status across two generations. The most common proxy variables are income, educational attainment, and "social class", each of which have distinct advantages and limitations with respect to their estimation and interpretation. Parent-child associations are not the only measure for the importance of family background, and recent research on *multigenerational* suggests that they may understate the transmission of advantages.

Moreover, only a small share of parent-child correlations in socio-economic status is due to the causal effect of status itself. Instead, cognitive and non-cognitive skills appear to be important mediators, and children tend to resemble their parents also in terms of preferences, attitudes and beliefs. Genetic transmission is important, but the literature provides also ample evidence that the childhood environment matters, and that policies and economic shocks can have substantial intergenerational spill-over effects.

The second part of the report reviews evidence on how mobility varies between countries, over time, or along other dimensions. Income mobility appears higher in most EU member states than in the US, comparatively low in the UK and in Italy, and particularly high in the Nordic countries. Income mobility varies also substantially across areas within countries. The cross-country pattern in education appears similar as in income, and indicates low educational mobility in the Eastern EU member states. In contrast, the cross-country ranking in occupation-based "social class" measures deviates substantially from the pattern observed in measures of educational or income mobility.

While mobility increased in many countries during the first half of the 20th century, more recent time trends appear less conclusive. Studies on mobility trends are particularly data intensive, and may not be reliable enough to capture more gradual changes over time. Because income inequality and income mobility tend to be negatively correlated, both across countries and across areas within countries, there is particular interest on mobility trends in those countries where income inequality has been increasing.

However, descriptive associations can only be suggestive of causal links. The third part of the report reviews evidence from more targeted causal research designs, focusing on strands of the literature that relate to the functioning of educational systems:

First, on *neighbourhoods and schools*. Is the observed transmission of inequalities due to direct parental influences, or factors that are only indirectly related to parents, such as neighbourhoods and schools? Recent studies based on policy experiments and other research designs show that neighbourhoods do affect the intergenerational transmission of advantages, and suggest that the quality of schools plays an important role in that relation.

Second, on *early childhood and childcare*. Skill and achievement gaps between socio-economic groups open already at early age, motivating research on the early family en-

vironment. Evidence from European countries suggests that the expansion of universal childcare tends to have important benefits for children from disadvantaged backgrounds. However, those children who tend to benefit most from formal childcare may in fact be less likely to attend.

Third, on *early track choice*. In many countries, children are separated into different school tracks according to their observed ability. There is substantial evidence that *early track-choice* – the separation of children by ability at an early age – tends to reduce socio-economic mobility. This conclusion is based on targeted research designs that exploit differences in the timing of school reforms across regions within a given country, but is also consistent with cross-country comparisons from international achievement tests.

Fourth, on *private and public education*. By benefitting children irrespective of family background, the provision of public education may enhance intergenerational mobility. Public expenditures dedicated to non-tertiary or tertiary education as a share of GDP appear positively correlated with income mobility. Moreover, recent work argues that even in developed countries, credit constraints affect educational investments of certain groups in the population, harming intergenerational mobility.

Fifth, on *informational frictions and beliefs*. Disadvantaged families might underinvest in the human capital of their children because they lack information, or have different beliefs, on the functioning of educational systems. Recent work suggests that beliefs about the returns to educational investments vary with socio-economic background, and that those beliefs are predictive of actual investment decisions. Moreover, student choices appear responsive to informational interventions.

Finally, the report describes how important data availability and quality are in mobility research. An important trend is the increasing use of *administrative sources*, such as social security or tax data. The large scale of those data enable more targeted research designs, and to describe the intergenerational transmission process in more details. However, this shift towards administrative sources faces many technical and legal hurdles. The report identifies the most important obstacles for mobility research, and points to data initiatives that could improve our understanding of intergenerational processes in the future.

1. Measuring Intergenerational Mobility and its Drivers

This report reviews recent research on *intergenerational mobility* and the transmission of socio-economic status from parents to their children. It aims to provide an overview on the extent to which advantages are being transmitted from one generation to the next, the pathways via which this transmission occurs, and how environmental factors and educational policies may affect those processes.

Questions on mobility are closely linked to questions on inequality more generally. A lack of intergenerational mobility is more consequential if inequality is high. Conversely, how inequalities are perceived depends on the degree to which they are transmitted from parents to their children. For example, while market-based economies may generate high levels of income inequality, it has been argued that they also tend to generate high intergenerational mobility – inequalities may be more acceptable if “everyone has a shot” at success.

However, income inequality has been rising in many countries over the recent decades, and research in the 1990s and 2000s demonstrated that those inequalities are in fact much more persistent across generations than previously believed. These developments have reinvigorated interest in mobility research, not only within the sociological literature in which the topic has long been perceived as fundamental, but also in economics, in which distributional concerns are receiving increasing attention.

The report covers conceptual questions on how to measure mobility, summarises empirical evidence on both descriptive and causal questions, and describes the particular data requirements that this literature faces. The aim of this report is not to provide an exhaustive account of the vast literature, but to provide an up-to-date overview of various interesting and policy-relevant strands of current research.

The review covers work from multiple disciplines, but the emphasis is on empirical work in economics. Moreover, the report focuses on *relative* mobility (also called “social fluidity”), and, in particular, on how well children from disadvantaged backgrounds do relative to children from a more advantaged background. *Absolute* mobility compares instead the socio-economic status of children to the status of their parent, and is closely related to economic growth. ⁽¹⁾

Special emphasis is on the role of educational systems, which appear particularly central for the transmission process. While educational attainment has few immediate implications for consumption and welfare, it is an important mediator for other socio-economic outcomes. It is also more closely linked, and potentially more amenable to policy than other transmission channels. Educational systems are therefore seen as one of the primary tools for policy to affect mobility, and educational reforms are sometimes explicitly motivated from this perspective.

In the public and political debate, educational systems and meritocratic processes are often seen as a potential vehicle for achieving “*equality of opportunity*”. However, from a conceptual perspective, they can either amplify or reduce mobility (Bowles 1972). A particularly bleak picture on the role of educational systems has been painted by the sociologist Michael Young, who coined the term *meritocracy* in his 1958 novel “*The Rise of the Meritocracy*”. In contrast to its modern-day usage, Young had a negative connotation in mind. The meritocratic world of his novel is one of low mobility, as a highly selective educational system promotes only those who are judged to already have merit. But extremely “egalitarian” systems may not create much intergenerational mobility either. Checchi et al. (1999) argue that a highly centralised system, which provides the same

⁽¹⁾ For example, a daughter born to parents in the bottom quartile of the income distribution may reach substantially higher income than her parents (contributing to *absolute* mobility), but may still be in the bottom quartile of the income distribution relative to others from her own generation (not contributing to *relative* mobility).

quality of education to every child, may not create enough incentives for children from disadvantaged background to “prove” their talent.

Section 2 describes *how* intergenerational mobility can be measured. It is typically much easier to measure social and economic phenomena than to identify their causes, but even the measurement of intergenerational processes tends to be difficult. The literature spans different disciplines, and measures the socio-economic status of parents and their children in many different ways. The most common proxy variables are income, educational attainment, and occupations or “social class”, each of which have distinct advantages and limitations with respect to estimation and interpretation. Moreover, parent-child associations are not the only measure for the importance of family background. Research on *sibling* and *multigenerational* correlations suggest that they may in fact understate the transmission of advantages from one generation to the next. Some recent studies tracking families over three or more generations suggest that socio-economic inequalities are substantially more persistent than parent-child measures would suggest.

Quite many transmission channels contribute to the parent-child association in socio-economic status, and only a small share appears to be due to the causal effect of status itself – increasing the income or education of parents has, in itself, only a limited effect on the income or education of their children. Instead, the transmission of cognitive and non-cognitive skills appears to explain a substantial share. Moreover, the systematic gap in skills with respect to parental background opens already early in life, motivating research on genetic transmission and the early family environment. Children resemble their parents not only in skills, but also in terms of their preferences, attitudes and beliefs, such as risk and trust attitudes. Research considering different type of biological and adopted children suggests that genetic pathways are very important, but post-birth environmental factors matter as well. Policies and economic shocks that affect parents can have substantial spill-over effects on their children.

Section 3 provides an overview of the *descriptive* evidence on intergenerational mobility, considering four main strands of the literature on (i) cross-country differences in mobility, (ii) mobility differentials across areas at the sub-national level, (iii) mobility trends over time, and (iv) the relationship between cross-sectional inequality and intergenerational mobility.

Studies considering income or education provide a comparatively similar picture on cross-country differences in mobility. Income mobility appears higher in most EU member states than in the US, which is characterised by particularly high levels of income inequality *and* low intergenerational mobility. However, there is substantial variation across EU member states. Among the countries for which evidence is available, income mobility appears particularly low in the UK and in Italy, and particularly high in the Nordic countries. In addition, the Eastern member states appear to have comparatively low levels of educational mobility. The pattern in terms of income and education differs however quite substantially from the cross-country pattern in occupation-based “class” mobility.

More recently, researchers have begun to study variation in intergenerational associations across areas within countries. This research tends to be based on administrative data sources, as their large scale allows the measurement of those associations in finely defined areas or groups. This “area approach” yields many more observations than a cross-country comparison with at most a few dozen countries, and keeps some of the institutional factors that vary between countries fixed. As such it can be more suggestive of causal links. Indeed, this literature documents not only that intergenerational associations vary substantially across regions in both the US and European countries, but also that some of that variation is causal.

While mobility increased in many countries during the first half of the 20th century, evidence on more recent cohorts is less conclusive. Income mobility appears to have decreased in the UK and stalled in many other countries. Inequality and intergenerational mobility tend to be negatively correlated – countries with high income inequality tend to

have low income mobility. This makes the US a particularly interesting case: given the recent rise in income inequality in the US, has mobility been declining? The evidence is not conclusive yet, with some authors finding a stable trend and others arguing that mobility has indeed been declining. Studies on mobility trends are particularly demanding, as they require comparable data in both the intergenerational and time or cohort dimension. In many countries, the available evidence may not be reliable enough to capture more gradual changes of mobility over time.

Section 4 provides *causal* evidence on how certain aspects of the educational system affect intergenerational mobility. While descriptive work can be suggestive of causal links, we require more targeted research designs to detect causal relationships with sufficient certainty. Researchers exploit sudden policy changes or other sources of variation that affect some groups but not others. We review evidence from several active strands of the literature, specifically, on the importance of (i) neighbourhoods and schools, (ii) early childhood and childcare, (iii) educational systems and track choice, (iv) private and public education, and (v) informational frictions and beliefs.

To separate the direct effect of parents on their children from the influence of neighbourhoods and schools is difficult, because the sorting of families across neighbourhoods and schools is not random. However, studies based on different type of policy experiments, and families moving from one area to another, shows that neighbourhoods do indeed affect the intergenerational transmission of advantages – certain areas provide better chances for upward mobility of children from disadvantaged background than others. We review the role of neighbourhoods and schools in Section 4.1.

The observations that skill gaps between socio-economic groups open already at early age, and that those gaps may be particularly consequential for achievements later in life, motivates research on the early family environment. Evidence from European countries suggest that expansions of universal childcare policies tend to have important benefits for children from disadvantaged background. However, those children who tend to benefit most from formal childcare may in fact be less likely to attend. The mere provision of formal childcare may thus not guarantee that it reaches those who would benefit most. We review the related literature on early childhood and childcare in Section 4.2.

The structure of educational systems also matters. In many countries, children are separated according to abilities into different school tracks or types, which may constrain their future educational choices. There is substantial evidence that early track-choice – the separation of children by ability at an early age – tends to reduce socio-economic mobility. The most direct evidence stems from targeted research designs that exploit differences in the timing of school reforms across regions within a given country. In addition, the negative association between early track choice and intergenerational mobility has been observed in cross-country comparisons from international achievement tests. We briefly review the empirical evidence on this question in Section 4.3.

By benefitting children irrespective of family background, the provision of public education may have a positive effect on intergenerational mobility. Indeed, public expenditures dedicated to non-tertiary or tertiary education as a share of GDP appear positively correlated with income mobility. One potential reason why the public provision of schooling may increase intergenerational mobility is the fact that some low-income families might not be able to finance educational investments, even if their children would benefit greatly. A recent body of work argues that credit constraints do matter in developed countries, at least for some specific groups of the population. We review the argument and related empirical evidence in Section 4.4.

Disadvantaged families might underinvest in the human capital also because of informational frictions and barriers, or differences in beliefs. Recent research has documented that beliefs about the returns to educational investments vary with socio-economic background, and that those beliefs are predictive of actual investment decisions. Moreover, student choices do indeed respond to informational interventions. Section 4.5 reviews some of the recent evidence.

Section 5 describes how important data availability and quality are for mobility research, and how access to better data has dramatically changed our understanding of intergenerational processes. An important trend in the social sciences in general, and mobility research in particular, is the increasing use of administrative sources (such as social security and tax data). The large scale of those data enables researchers to exploit policy variation across regions, leading to many of the causal insights described in this report. It also allows researchers to measure the intergenerational transmission of socio-economic status in much more details. However, the shift towards administrative sources faces many technical and legal hurdles. The report identifies some of the most important obstacles.

Section 6 concludes and identifies some themes for future policy and research. It also describes what data would be most useful to make further progress on descriptive and causal questions, and points to a number of initiatives that could greatly improve the data availability for mobility research.

2. Measuring Intergenerational Mobility

Before reviewing descriptive evidence on the intergenerational transmission of socio-economic status (see Section 3), we review how it can be measured. It is typically much easier to describe social and economic phenomena than to identify their causes, but intergenerational mobility is an unusual subject in that even its measurement is difficult. The evidence is hard to review also for other reasons.

First, it is not obvious *what* we ought to measure, inequality in *socio-economic status*, or inequality in *opportunities*? The former relates to the outcome that we want to explain (some people are better-off), the latter to circumstances that explain this outcome (why are some people better-off). The literature on *intergenerational mobility* takes the first route, measuring associations that do not distinguish between the causes of mobility. Studies on "*inequality of opportunity*" distinguish instead between circumstances that are outside of personal control and factors for which the individual is potentially responsible (e.g. Ferreira and Gignoux, 2011). In practice, the two literatures are closely related. While intergenerational measures lack a normative motivation, they are nevertheless the foundation for much causal and policy-relevant work (see Section 4). ⁽²⁾ We therefore focus on intergenerational associations in this review.

Second, *how* should socio-economic status be measured? Work on socio-economic mobility spans across sociology, demography, economics and behavioural genetics. Each of these disciplines has its distinctive perspective, conventions and preferred methodology. For example, while economists have been primarily interested in income, occupational outcomes have played a central role in the sociological literature. With many outcomes, and many ways to measure each of them, a variety of approaches co-exist. This diversity enriches the debate but complicates comparisons across disciplines.

Third, the literature distinguishes between *absolute* and *relative* mobility. The former measures how well children do compared to their parents, which is closely related to economic growth. In many developed countries, absolute mobility has been declining because economic growth has been slower in recent than in previous decades. In contrast, measures of relative mobility abstract from economic growth by comparing individuals from the same generation – measuring how children from disadvantaged backgrounds do relative to children from a more advantaged background. The literature, and this review, focuses on relative mobility (often called "social fluidity" in the sociological

⁽²⁾ That is, even if we should focus more on which circumstances hinder mobility and less on the extent of mobility per se (Hout 2015), the measurement of mobility is often a necessary first step.

literature).⁽³⁾

Fourth, apart from these conceptual questions, the measurement itself is challenging. Only few data sets contain socio-economic information on both parents and children, and the identifying information to link the two generations. Even then, the data may not be representative or give only a snapshot of socio-economic status at a particular age.⁽⁴⁾ Retrospective surveys may be more representative and contain more detailed information, but tend to be too small to study institutional or policy variation at the sub-national level. We return to data requirements and limitations in Section 5.

In the next subsections, we review how socio-economic mobility is being measured in terms of income, educational attainment, occupations, and social class. We focus first on the traditional parent-child associations, but describe alternative measures of the importance of family background in Section 2.4. To put these measures into context, we briefly discuss which channels and characteristics contribute to the association between parent and child socio-economic status in Section 2.5. Due to space limitations, we do not review intergenerational associations in wealth (see for example Black et al 2015, Boserup et al. 2016, and Cesarini et al. 2016), consumption, or health. Surveys providing further details on the conceptual and technical aspects of mobility measurement include Solon (1999), Black and Devereux (2011), Jäntti and Jenkins (2014) and Heckman and Mosso (2014).

2.1 Income Mobility

In the economic literature, mobility is typically characterised in terms of income (or earnings). Income is a useful measure for several reasons. It is an important component of socio-economic status and standard of living. In contrast to other measures it has an inherent scale, simplifying comparisons across countries or time. Income may also relate to the underlying mechanisms of intergenerational transmission. For example, the early theoretical literature in economics focused on the role of parental monetary investments in the human capital of their child (Becker and Tomes 1979, 1986).

But income is hard to measure. Ideally, we would measure the *lifetime income* for both parents and children, but most data sets offer only short snapshots of income over short age intervals. This introduces statistical noise into the estimation, which tends to reduce intergenerational correlations (e.g. Atkinson 1980; Solon 1999). Moreover, income differences between individuals tend to be larger in mid or late career than at earlier stages. Mobility measures that do not abstract from the magnitude of income differences are therefore sensitive to the exact age at which incomes are measured (Jenkins 1987, Nybom and Stuhler, 2017), and methodological improvements in addressing this problem have led to large revisions in estimates (Jäntti and Jenkins 2014). Today, researchers typically aim to measure income around midlife, when this problem is reduced (Haider and Solon 2006). But few data sets report incomes in midlife for both parent and child generations, and cross-country comparisons are likely still tainted by differences in the quality of the respective estimates.

Assuming that observations of parent and child income are available, we can study their relationship parametrically or non-parametrically. Non-parametric methods aim to provide a more detailed picture. For example, *transition matrices* report the transition probabilities between different income groups, such as the probability that a child from parents in bottom quintile can reach the top quintile ("*upward mobility*"). But for compari-

⁽³⁾ See Ludwinek et al. (2017) for a survey of absolute mobility in EU member states, and discussion of relative mobility in terms of "social fluidity".

⁽⁴⁾ This is problematic because individuals experience also much intra-generational mobility over their life-cycle (Jäntti and Jenkins, 2014) and this life-cycle pattern may depend on parental background.

sons between groups, it is often more practical to use parametric assumptions that reduce the relation between parent and child income to a single summary measure.

The traditional summary measure has been the *intergenerational elasticity of income* (IGE), defined as the slope coefficient in the regression

$$y_{i,child} = \alpha + \beta y_{i,parent} + \epsilon_i$$

where $y_{i,child}$ is the logarithm of child income and $y_{i,parent}$ is log parental income (e.g. Solon 1999). This coefficient β captures to what degree income differences between parents are associated with income differences among their children. For example, a value of β equal to 0.5 means that a child from parents who have 10 percent higher income than the mean in their generation have on average 5 percent higher income than the mean in their own generation. We review cross-country evidence based on the IGE in Section 3.

Other popular summary measures are the *intergenerational correlation* (IGC) and *rank correlation* coefficient (IRC). The IGC is simply the Pearson correlation coefficient between the logarithm of child and parent incomes, while the IRC is the correlation between the rank of child and parent incomes in their respective generation. A correlation of one reflects perfect immobility. In contrast to the IGE, the IGC and the IRC abstract from changes in the variance of income from one generation to the next. In many developed countries, the extent of income inequality has increased in recent decades. This increases the IGE accordingly (as differences in the parent generation map into larger differences in the child generation), but not necessarily the IGC or IRC.

In many countries, including EU member states, intergenerational data containing income for both parents and children are not available. To provide evidence for these countries, the literature relies on so-called two-sample instrumental variable estimators (Inoue and Solon 2010) that impute the missing income of parents based on other socio-economic variables, such as education or occupation. The approach has been popular, as it can be implemented in data sets that only contain few information on parental characteristics (such as the EU-SILC). However, it has not been well tested how closely it can approximate the IGE. This is problematic, because for many countries, two-sample estimators are all we have (see Corak 2013).

2.2 Educational Mobility

Educational outcomes are more easily measured than other socio-economic outcomes, and they are closely related to the mechanisms underlying the intergenerational transmission of socioeconomic status. In particular, educational outcomes are considered to be important mediators for income and occupational success.

While educational outcomes are considered in all disciplines, the way they are operationalised tends to be different. In economics, educational attainment is usually expressed in cardinal units. For example, a completed degree might be transformed into the years of schooling that is usually required to achieve this degree. As for income, the intergenerational association in years of schooling can then be approximated with a single regression or correlation coefficient. In other disciplines, educational outcomes are more commonly transformed into ordinal rankings, for example by ranking degrees. The usefulness of either approach depends on many factors, such as how interested we are in a particular educational transition, and on how well the relation between parent and child years of schooling can be approximated by a linear function.

That educational outcomes can be coded very differently relates to an important limitation in their interpretation. The meaning of "twice as much" is clear and objective for income, less so for educational outcomes. Educational degrees might not be entirely

comparable across countries or time (Shavit and Blossfeld 1993), an issue that is hidden but not eliminated when transforming educational degrees into years of schooling. Apart from this conceptual issue, education is much easier to measure than income, and more frequently reported in intergenerational data. As most people complete their education in their twenties, it can be well captured by a single measurement in early life – irrespective of current employment status.

Educational outcomes are therefore considered in settings with limited data availability, even in countries for which income measures are in principle available. For example, educational and income information can be combined to provide a more up-to-date assessment of socio-economic mobility for cohorts that are still very young (e.g. Chetty et al., 2014b). For the same reason, educational statistics are used to extend the scope of cross-country comparisons (Hertz et al. 2008). A limitation for historical or trend analysis is that there is often little variation in educational outcomes in earlier generations, in which only a small share of the population might have more than basic schooling. This has adverse effects on the comparability of estimates, as well as their statistical precision.

More recently, interest has risen also in the “horizontal” dimension of educational careers, in particular in terms of field of study and institutional quality. For example, Kim et al. (2015) show that lifetime earnings gaps between college graduates from different fields in the United States can be larger than the gap between high school graduates and college graduates overall. Moreover, there are important quality differences of institutions with a given field. Researchers are therefore studying the social gradient and causal effect of attendance at selective “elite” compared to less prestigious institutions (e.g. Attanasio and Kaufmann 2009, Chetty et al. 2017).

2.3 Occupational and Class Mobility

Occupational outcomes have long been the socio-economic measure of choice in the sociological literature. Similarly as educational outcomes, occupations can be transformed into cardinal variables such as “occupational prestige” (as in Treiman and Ganzeboom 1990, Ermish and Francesconi 2002), or used to define *social classes* by aggregating occupations that share a similar socio-economic status into various major groups (“macro classes”, as in Erikson and Goldthorpe 1992) or a larger number of finer groups (“micro classes”, as in Jonsson et al. 2009).

Occupational and class measures share some of the advantages and disadvantages of educational measures. They vary less over the life-cycle than income, so even a single observation can be informative about an individual’s socio-economic status. But in contrast to income, they lack an inherent scale, and different authors opt for different classifications.

Occupational outcomes are particularly useful when considering historic data. In contrast to income, occupations are frequently reported in historical censuses and other data sources (as for example in a 15th century tax survey in Florence, see Barone and Mocetti 2016). And in contrast to education, there tends to be substantial variation in occupational status even in older generations (although a sizeable chunk may be farmers). Still, the comparability of occupational measures over time and across countries remains limited. For example, how does the socio-economic status of a teacher today compare to the status in the early 20th century? ⁽⁵⁾

The pattern of occupational persistence may relate to certain channels of intergenerational transmission. For example, the observation that children tend to work in the same

⁽⁵⁾ The problem can be partially addressed by re-ranking occupations over time (see for example Modalsli 2015).

occupation or even the same firms as their parents (Corak and Piraino 2010) might be due to the transmission of abilities and preference, but also to the presence of nepotism or the importance of social networks (see for example Jonsson et al. 2009, Munshi 2011).

2.4 Multigenerational and Horizontal Measures

Parent-child associations of socio-economic status, such as those discussed in the previous sections, may understate the transmission of advantages. For example, the intergenerational elasticity discussed in Section 2.1 captures inequalities in income, but parents may differ in other aspects, and may provide advantages that are not fully reflected in child income. Moreover, some of these advantages might be inherently unobservable. Such unobserved or *latent* factors played a prominent role in the early sociological research, such as Duncan (1969), and in standard economic models (see also Goldberger 1972). ⁽⁶⁾ While these factors relate to the underlying mechanisms of the transmission process, they also affect its measurement – how can we measure the transmission of advantages if some of those advantages cannot be directly observed?

This question motivates also the literature on *sibling* correlations, i.e. the correlation in socio-economic status between two randomly drawn siblings (e.g. Solon et al. 1991, Levine and Mazumder 2007, Björklund et al. 2009). The family background quantified in sibling correlations is a latent factor that accounts for all factors shared by siblings, not only those that can be explained by the observed socio-economic status of parents. Sibling correlations are therefore a more comprehensive measure of family background than parent-child measures. However, they also capture factors shared by siblings other than parental effects, such as peer and neighbourhood effects. Jäntti and Jenkins (2014) discuss the estimation and interpretation of sibling correlations in more details. Sibling studies are not only interesting from the measurement perspective, but may be also informative about the mechanisms of intergenerational transmission (see Section 4.1).

More recently, the existence of latent transmission channels has become a focal point in the literature on *multigenerational* persistence – on similarities in socio-economic status between more distant family members. It would rationalise why socio-economic inequalities appear more persistent across multiple generations than a naive extrapolation of parent-child correlations would suggest, as documented by a recent strand of literature such as Clark and Cummins (2012), Clark (2014), Lindahl et al. (2015), or Braun and Stuhler (2018). An alternative rationalisation of the same phenomena could be that distant family members other than parents have an additional direct effect on child status, i.e. that the intergenerational process has a “longer memory” (e.g. Mare 2011, Stuhler 2012, Chan and Boliver 2013, Adermon et al. 2016, and Anderson et al. 2018). While the mechanisms differ, either reasoning implies that parent-child correlations may greatly understate the intergenerational transmission of advantages.

The observation of multigenerational data across more than two generations provides an opportunity to identify the latent, or “true” transmission of advantages. With increased availability of historic and large-scale administrative sources (see Section 5), such evidence has become available in recent years. Some studies imply that the degree to which advantages are transmitted from one generation to the next is as high as 75 percent (Clark 2014), hence much higher than the 30-50 percent found in observable proxies of socio-economic status (see next section). This literature is still in its early stages, and other studies based on alternative strategies find lower rates of persistence (Vosters and Nybom 2017, Braun and Stuhler 2018, and Neidhöfer and Stockhausen, forthcoming).

⁽⁶⁾ For example, Becker and Tomes (1979) note that a person may be endowed with a great variety of unobserved cultural and genetic attributes, which in turn affect human capital accumulation and socio-economic status.

ing). The literature does however suggest that inequality may be substantially more entrenched than what has been captured by parent-child associations as reviewed in the next sections. ⁽⁷⁾

2.5 Pathways of Intergenerational Transmission

The next two sections consider variation in intergenerational associations over countries and time, and aspects of the educational system that affect intergenerational mobility. To put these findings into context, we discuss here briefly which channels and characteristics may contribute to the association between parent and child socio-economic status. A great number of such attributes play a role, and we provide here only an overview of some of the main insights from the vast literature on the topic.

A particularly important role is played by the transmission of cognitive and non-cognitive skills. For example, Blanden et al. (2007) find that skill differences at age 16 explain a substantial share of the intergenerational transmission of socio-economic inequalities in the UK. Carneiro and Heckman (2003) and Cunha and Heckman (2007) show that cognitive and non-cognitive skills differ systematically with parental background already at early ages, before schooling begins. The transmission of skills and abilities appears therefore to be a quite central component of the transmission of educational and other socio-economic advantages (Marks 2013). Moreover, the observation that skill gaps open so early in life motivates research on biological transmission channels, and on the role of childcare and the early family environment (see Section 4.2).

Children may resemble their parents not only in terms of their skills and abilities, but also in terms of their preferences, attitudes and beliefs. For example, Dohmen et al. (2012) find that risk and trust attitudes are positively correlated, as are other preferences and attitudes. Moreover, beliefs differ systematically with parental background, and these beliefs affect educational decisions (see Section 4.5). Parent and child characteristics correlate among many other dimensions that have been studied, motivating the “first law of behavioural genetics” (Turkheimer 2000), which states that all human behavioural traits are heritable.

The similarity of parents and children in terms of skills, attitudes and preferences may be due to genetic or environmental factors. Because nature and nurture interact, the distinction is not sharp, but the evidence nevertheless points to an important role for biological mechanisms. For example, Björklund et al. (2006) compare adopted and non-adopted children to study the importance of genetic and prenatal environmental relative to post-birth factors, such as the childhood environment. They find that both genetic and post-birth environmental factors play important roles in the intergenerational transmission of earnings and education. The importance of genetic factors has been also demonstrated in studies that compare monozygotic twins, dizygotic twins and other type of siblings.

While genetic pathways matter, we do know that educational and social policies have important effects on intergenerational transmission. Examples include the literatures on early childcare and early track choice in secondary schooling (see Section 4), or the observation that an increase in welfare receipt of parents causes increased dependence on welfare among their children (Dahl et al. 2014).

⁽⁷⁾ This literature also suggests that the degree of assortative mating must be very high. Spouse correlations in socio-economic outcomes such as income or education are typically between 0.4 and 0.6 (e.g. Fernández and Rogerson 2001, Ermisch et al. 2006, Greenwood et al. 2014), and therefore too low to explain intergenerational transmission rates around 0.75 (Clark 2014). But if spouses resemble each other in unobservable factors that determine socio-economic success, then spouse correlations in observable outcomes might understate the effective degree of assortative mating. Multigenerational data provide an exciting opportunity to test this hypothesis (see also Ermisch et al. 2006).

The direct causal effect of socio-economic status appears instead relatively small in developed countries. Individual parental attributes, such as education or wealth, appear to have only a limited causal effect on the socio-economic status of the next generation (e.g. Holmlund et al. 2011, Cesarini et al. 2016). ⁽⁸⁾ Family income appears to have only a modest effect on child outcomes, but a more sizable causal effect at the lower part of the income distribution (Loken et al. 2012).

Many other aspects are thought to play a role in the association between parent and child socio-economic status, such as the role of parental networks and preferences (Bello and Morchio 2018), or the existence of “welfare traps” (Dahl et al. 2014). Black and Devereux (2011) and Heckman and Mosso (2014) provide an overview over many other areas of research.

3. Intergenerational Mobility in Europe

In this section, we provide an overview of the *descriptive* empirical evidence on intergenerational mobility. We consider four main strands of this literature. First, evidence on cross-country differences in mobility. Second, the more recent evidence on mobility differentials within countries. Third, evidence on changes in mobility over time. Finally, evidence on the relationship between cross-sectional inequality and intergenerational mobility. Emphasis is on evidence for Europe, but we also cover some work from other countries that extended the descriptive literature in interesting ways.

3.1 Comparing Intergenerational Mobility across Countries

How persistent are differences in socio-economic status across generations, and does the rate of persistence vary between countries? Such questions are interesting from a purely descriptive perspective, but cross-country comparisons can be also a useful indicator for causal mechanisms. In particular, researchers study whether countries with low inequality or high mobility share certain institutions and policies. However, in practice, countries vary in many aspects, making it difficult to link mobility differences to any particular factor and limiting the potential of cross-national studies for causal analysis. To address these limitations, the literature has recently began to study spatial variation in mobility *within* countries (next subsection).

Table 1 lists intergenerational mobility estimates from various cross-national comparisons based on income, education and social class (see Section 2). The first four columns report estimates of the intergenerational elasticity of income between fathers and sons (as described in Section 2.1), taken from Blanden (2011), Corak (2013) and Bratsberg et al. (2007). The fifth column reports estimates of the intergenerational correlation in years of schooling (as described in Section 2.2), taken from Hertz et al. (2008). The sixth column reproduces estimates of occupation-based class mobility (as described in Section 2.3), taken from Ludwinek et al. (2017). ⁽⁹⁾

Estimates of the intergenerational elasticity of income vary substantially between the three included studies, reflecting how difficult it can be to measure income mobility

⁽⁸⁾ While educational expansion may then have only limited effects on the relative success of individuals, it may of course still have a large overall effect on the affected cohorts.

⁽⁹⁾ Cross-national comparisons measuring social class may be less reliable when based on different survey sources (Breen and Luijkx 2004). However, Beller and Hout (2006) and Ludwinek et al. (2017) present cross-country comparisons of class mobility based on a standardised data source.

based on short series of income. Despite these differences, the implied ranking of countries is very similar. As reported in Table 2, the correlation between the estimates reported by Blanden (2011) and Corak (2013) is 0.92, and the other two pair-wise correlations are even higher. These high correlations reflect that in terms of income mobility, a number of major cross-country differences are well established.

The intergenerational elasticity of income (income mobility) is lower (higher) in most EU member states than in the United States. Moreover, it varies substantially across countries within Europe. ⁽¹⁰⁾ The intergenerational elasticity is particularly low (and hence income mobility is high) in the Nordic countries (see also Jäntti et al. 2006), with at most 30 percent of income inequalities being transmitted from parents to children, compared to about 50 percent (or even higher, see Mazumder 2016) in the US. Within Europe, the intergenerational elasticity of income appears comparatively high in the UK (see also Blanden et al. 2004) and Italy (Checchi et al. 1999, Piraino 2007 and Mocetti 2007). The elasticity appears somewhat lower in France (Lefranc et al. 2008) and Spain, although there are fewer estimates available, in particular for Spain. Income mobility is higher, but not as high as in the Nordic countries, in Germany (Vogel 2006 and Eisenhauer and Pfeiffer 2008).

The fourth column of Table 1 reports estimates of the intergenerational correlation in years of schooling from Hertz et al. (2008). Parents' education is defined as the average of mothers and fathers. The ranking of countries in terms of educational mobility is quite similar to their ranking in terms of income mobility, with pair-wise correlations between the two measures of around 0.7 (see Table 2, and Blanden 2011 for a more detailed comparison). This result suggests that education can be a useful proxy for socio-economic mobility in settings in which more detailed information on income or occupations are not available. In particular, the estimates suggest that most Eastern European countries have only medium or low rates of educational mobility.

Finally, the fifth column of Table 1 reports estimates of class mobility or "social fluidity" in EU member states, based on Ludwinek et al. (2017). ⁽¹¹⁾ The measure summarizes relative mobility between nine broadly defined social classes, with the social origin being classified according to the reported occupation of the father and the mother. The estimates are scaled with respect to a reference category, with higher values reflecting less social fluidity. The ranking of countries in terms of class mobility differs more markedly from their ranking in terms of educational or income mobility (see Table 2), with only the high mobility in Nordic countries being similarly captured by all mobility measures.

This result is consistent with Blanden (2011), who shows that income- and education-based mobility measures differ also from the class-based rankings of Erikson and Goldthorpe (1992) and Breen and Luijkx (2004). A number of reasons may contribute to this contrast. While sociologists have developed standardised class measures that can be applied across countries, they might still not be as comparable as measures of income or education. Moreover, income can vary markedly even within social classes, and this variation might be associated with socio-economic success of the next generation (Blanden 2011; see also Blanden et al. 2012). On the other hand, class mobility might be a more reliable indicator of advantages for those countries where the quality of income data is particularly poor (see Erikson and Goldthorpe 2010, Goldthorpe 2013).

While the ranking of countries in terms of income and educational mobility are fairly well established, the interpretation of those differences is still debated. Mobility in the Nordic countries might be high because they share institutions that foster equality of opportunity (see also Section 4.2 and 4.3), but this interpretation can be disputed. For example, Raaum et al. (2007) find that mobility in the earnings capacity as measured by educa-

⁽¹⁰⁾ The intergenerational elasticity of income is only a rough summary measure, and studies such as Raaum et al. (2007), Björklund and Jäntti (2009), and Corak et al. (2014) provide additional details on mobility pattern in these countries.

⁽¹¹⁾ The values are approximations based on Figure 7 in Ludwinek et al. (2017).

tion is more similar across the US, UK and Nordic countries, and Landerso and Heckman (2016) suggest that the high income mobility in Denmark may be better explained by policies affecting the income distribution than by significant differences in the intergenerational transmission of human capital. Moreover, little is known on how the persistence of inequality across multiple generations varies between countries (see Section 2.4).

Table 1: Intergenerational Mobility Estimates Across Countries

Country/ Author	Intergenerational Elasticity of Income (IGE)				Education	Social Fluidity
	Average (IGE)	Corak (2013)	Blanden (2011)	Bratsberg et al. (2007)	Hertz et al. (2007)	Ludwinek et al. (2017)
United Kingdom	0.44	0.50	0.37	0.45	0.31	0.74
Poland	-	-	-	-	0.43	0.95
Italy	0.42	0.50	0.33	-	0.54	-
France	0.37	0.41	0.32	-	-	0.93
Spain	0.40	0.40	-	-	-	1.04
Germany	0.28	0.32	0.24	-	-	0.95
Slovakia	-	-	-	-	0.37	0.71
Sweden	0.26	0.27	0.24	-	0.40	0.92
Hungary	-	-	-	-	0.49	0.97
Belgium	-	-	-	-	0.40	0.57
Czech Republic	-	-	-	-	0.37	0.84
Norway	0.19	0.17	0.25	0.156	0.35	-
Finland	0.19	0.18	0.20	0.189	0.33	0.70
Denmark	0.14	0.15	0.14	0.121	0.30	0.64
Ireland	-	-	-	-	0.46	0.78
Netherlands	-	-	-	-	0.36	0.63
Portugal	-	-	-	-	-	1.29
Brazil	0.55	0.58	0.52	-	0.59	-
United States	0.47	0.47	0.41	0.542	0.46	-
Switzerland	0.46	0.46	-	-	0.46	-
Japan	0.34	0.34	-	-	-	-
Australia	0.26	0.26	0.25	-	-	-
Canada	0.21	0.19	0.23	-	0.40	-

Notes: Corak (2013) and Blanden (2011) summarise estimates of the father-son elasticity of income from different studies and different time periods. Bratsberg et al. (2007) use multiple data sources, measuring child earnings in the 1990s and early 2000s. Hertz et al. (2008) estimate the parent-child correlation in years of schooling in multiple survey data from the 1990s and early 2000s. The estimates of social fluidity from Ludwinek et al. (2017, values approximated from Figure 7) are based on the European Social Survey from 2002 to 2010, and for cohorts born between 1965 and 1975.

Table 2: Correlation in Intergenerational Mobility Estimates Across Countries

	Corak (2013)	Blanden (2011)	Bratsberg et al. (2007)	Hertz et al. (2007)	Ludwinek et al. (2017)
Corak (2013)	1				
Blanden (2011)	0.916	1			
Bratsberg et al. (2007)	0.980	0.956	1		
Hertz et al. (2007)	0.738	0.738	0.644	1	
Ludwinek et al. (2017)	0.483	0.387	-	0.606	1

Notes: The table reports the Pearson correlations between the income-, education- and class-based mobility measures from Table 1.

3.2 Spatial Variation within Countries

The importance of parental background may vary not only between countries, but also across areas *within* countries. This variation is particularly valuable for causal analysis. First, many institutions and policies apply to all areas within a given country, so that the list of potential causal factors is more manageable. Second, the within-country perspective may offer many more, and more consistently measured, data points than cross-country studies, allowing us to test more systematically which factors are associated with socio-economic mobility. As a consequence, the *area approach* has become popular in both descriptive and causal work (see Section 4).

An influential descriptive contribution has been Chetty et al. (2014a), who use administrative tax records to characterise how the extent of intergenerational mobility varies across commuting zones in the US. They find that mobility varies substantially across regions in the US, and across commuting zones within regions. The chances for children from a parent in the bottom income quintile to reach the top quintile varies substantially, between 4.4 percent in Charlotte and 12.9 percent in San Jose. These differences may not only be due to causal factors, but Chetty et al. find that high mobility areas have less residential segregation and income inequality, better primary school, greater social capital (as measured by community participation) and family stability.

Similar studies are being developed for many other countries, including EU member states. Bütikofer et al. (2016) document spatial variation in socio-economic mobility in Norway, and show that the Norwegian oil boom raised both absolute and relative socio-economic mobility of children from poorer families in those regions that were more heavily exposed to the boom. Güell et al. (2016) find that in Italy, socio-economic mobility correlates with a variety of “good” outcomes such as higher regional employment and lower unemployment, higher average schooling and lower cross-sectional income inequality. Connolly et al. (2017) provide spatial evidence for Canada, and similar research designs are being implemented for various other countries for which high quality administrative data is available (e.g. Heidrich 2016 for Sweden, Deutscher 2018 for Australia).

3.3 Trends in Intergenerational Mobility over Time

That income inequality has recently been rising in most developed countries is well documented (Autor and Katz, 1999; Atkinson et al., 2011), and the observation that it ap-

pears negatively correlated with intergenerational mobility – countries with high income inequality tend to have low income mobility – has received much attention (see Section 3.4). A central theme in the recent literature is therefore if inequality has not only increased, but also become more persistent across generations. This concern is prominent also in the public debate, particularly in those countries in which inequality has been rising strongly.⁽¹²⁾

Accordingly, a substantial literature has studied trends in intergenerational mobility over time. The findings are however not entirely consistent across studies, perhaps illustrating the methodological difficulties and high data requirements that studies on intergenerational mobility face. Studies on mobility trends are even more data intensive, as they require comparable data in both the intergenerational and time or cohort dimension. The available estimates can capture the broad pattern of mobility across countries, but are perhaps not reliable enough to capture more gradual changes of mobility over time.

For the United States, Hertz (2007), Lee and Solon (2009) and Chetty et al. (2014a) find no evidence of a major trend in income mobility in the second half of the 20th century, but cannot reject more modest changes over time. In contrast, Levine and Mazumder (2007) as well as Aaronson and Mazumder (2008) find that mobility has fallen in recent decades. Mazumder and Davis (2016) note that earlier studies have not observed those cohorts who entered the labour market when income inequality was rising, and argue that income mobility has declined around those cohorts.

In Europe, income mobility appears to have declined in the UK for cohorts between the 1950s and 1970s (Blanden et al. 2004, Blanden and Machin 2007, Nicoletti and Ermisch 2007, Blanden et al. 2012), while it increased in the Nordic countries (Bratberg et al. 2007, Pekkala and Lucas 2007, Björklund et al. 2009, Pekkarinen et al. forthcoming). The evidence for most other European countries is less conclusive. To detect changes in income mobility, which may be only gradual in nature, we require data for quite many families that are comparable over time. Many European countries lack suitable data sources to derive reliable estimates.

A more long-standing sociological literature has studied trends in educational, occupational or class mobility over time. Shavit and Blossfeld (1993) summarises evidence on educational inequalities across thirteen, mostly European, countries.⁽¹³⁾ They find that whereas educational attainment has increased across all social classes, the relative advantage associated with a privileged origin has remained quite stable in all but two countries. Breen et al. (2009) study trends in educational mobility across cohorts born in the first half of the 20th century in eight European countries. In contrast to Shavit and Blossfeld, they conclude that educational mobility has risen, more so in Sweden, the Netherlands, Britain, Germany and France than in Italy, Ireland or Poland.

Studying data spanning from the 1970s to 1990s, Breen and Luijkx (2004) find that class mobility has also been increasing in many European countries, except in Britain. Similarly, Ludwinek et al. (2017) find that class-based measures of relative mobility or “social fluidity” have increased in many EU member states for cohorts born in the period 1946-1964. In addition, they find that, over the same time period, measures of social fluidity have become more similar between member states. In contrast, social fluidity appears to diverge again for more recent cohorts, and follows quite different trends for

⁽¹²⁾ In the US it is now frequently argued that the combination of rising inequality and low mobility threatens social cohesion and the notion of “American exceptionalism”. Exemplary articles are “Ever Higher Society, Ever Harder to Ascend” in *The Economist* (Dec. 2004), “Moving up: Challenges to the American Dream” in the *Wall Street Journal* (May 2005), “The Mobility Myth” in *The New Republic* (Feb. 2012), or the “Great Divide” series on nytimes.com. Similar debates are prominent in the UK and some other European countries.

⁽¹³⁾ Few studies explore mobility trends across multiple socio-economic outcomes, and the literature on income and occupational or social class mobility are not well connected. In a rare exception, Erikson and Goldthorpe (2010), Blanden (2011), Blanden 2012 and Goldthorpe (2013) discuss to what degree trends in income and class mobility differ in UK.

men and women.

Most studies focus on the average association between child status and family background, but a particular concern in the public debate is how children from the most disadvantaged backgrounds fare. Markussen and Røed (2017) find that in Norway, men and women born to parents with particularly low earnings have fallen behind in various quality-of-life outcomes, particularly in terms of the prime-age employment rate for men. The study illustrates also how research on administrative data can lead to novel descriptive evidence, as its large scale allows researchers to study intergenerational associations for finely defined subgroups of the population (see also Section 5.2).

3.4 Inequality and Intergenerational Mobility

The relationship between income inequality and intergenerational mobility has seen much interest in the recent literature. This interest is motivated by the observation that the returns to skill have been increasing from around 1980 in the US and other OECD countries, and by the observation that inequality and intergenerational mobility tend to be negatively correlated – countries with particularly high income inequality tend to have comparatively low income mobility (e.g. Björklund and Jäntti 2009 or Blanden 2011).

This negative association between inequality and mobility, sometimes dubbed the “*Great Gatsby Curve*” (see Corak, 2013), is consistent with theoretical models of intergenerational transmission. For example, in Solon (2004) parents are more inclined to invest in the human capital of their children when the returns to skills are higher, which will tend to decrease mobility if some parents are not able to finance those investments (see also Section 4.4) or if the returns to investment vary with parental background. A causal link may arise also via segregation. For example, higher inequality may increase residential segregation, which in turn might decrease mobility (see Durlauf and Seshadri, 2017).

This observed statistical association between inequality and mobility is sometimes interpreted causally, with some commentators warning that income mobility should be expected to decline in those countries in which income inequality has been rising. That interpretation is in line with theoretical rationalisations of the observed association, but most of the empirical evidence so far has been descriptive, and cross-country comparisons are not well suited for causal analysis (see also Section 3.1).

However, the negative relation between inequality and mobility can be also observed across areas within countries. Chetty et al. (2014a) show that across commuting zones in the United States, high-income inequality (as captured the Gini coefficient of parent income, or the income share of the top one percent) is associated with low intergenerational mobility. Likewise, Güell et al. (2016) find that in Italian provinces in which income inequality is larger, income mobility tends to be lower. Overall, inequality and intergenerational mobility do indeed seem to be related, but the underlying mechanisms are as yet not well understood.

4 Causal Evidence

This section reviews evidence from *causal* research designs. While descriptive work as reviewed in the previous section can be suggestive of causal links, we require stronger and more targeted research designs to detect causal relationships with sufficient certainty. Often, researchers exploit sudden policy changes, or other factors that affect some children but not others. The literature studies a broad range of mechanisms, but we focus here on questions that relate to the functioning of educational systems. Because

causal relationships may hold more generally, we focus less on the European context than in the previous sections.

4.1 Neighbourhoods, Schools and Segregation

Is the observed transmission of inequalities mainly due to parental influences, such as genetic transmission or parental time investments, or factors that are only indirectly related to parental socio-economic status, such as neighbourhoods and schools? ⁽¹⁴⁾ This question is difficult to answer, because the sorting of families across neighbourhoods and schools is usually not random (Durlauf 2004). Still, the observation that areas in the US with high upward mobility have less residential segregation, better primary schools, and greater social capital (Chetty et al. 2014a, see Section 3.2) suggests that the environment may be important.

And in rare circumstances, because of policies, external events or actual experiments, the allocation of neighbourhoods and schools *is* as good as random. One well-known example is the *Moving to Opportunity* experiment of the US Department of Housing and Urban Development, which offered a randomly selected subset of families from high-poverty areas vouchers to move to better neighbourhoods. Chetty et al. (2016) find that moving increases college attendance and earnings, but only if children move at a sufficiently young age (before age 13). Moving as an adolescent has instead slightly negative impacts, perhaps because of disruption effects. The duration of exposure appears therefore crucial.

Chetty and Hendren (2016) estimate the importance of neighbourhoods from non-experimental data, studying the outcomes of several millions of families who move across commuting zones in the US. While movers differ from non-movers, Chetty and Hendren exploit variation in the age of children at the time of the move; children who are younger tend to be more exposed to the new neighbourhood. The larger number of observations in the administrative compared to the experimental data allows a quite detailed analysis, which suggests that the benefits of moving increase linearly with the amount of time children spend growing up in a better area.

Bingley et al. (2017) provide evidence from a similar research design, and population-based administrative data in Denmark. Their findings suggest that moving to a better area has a pronounced effect on earnings inequality early in the working life, but the influence of neighbourhoods appear to fade when measuring earnings after age 30. The question is then not only by how much parents, neighbourhoods and schools affect socio-economic success, but also how their relative importance varies over the life cycle.

Apart from showing how important neighbourhoods are for mobility, such research designs may also tell us what it is about certain neighbourhoods that promotes upward mobility. For example, Laliberté (2017) decomposes the “total exposure effect” of a neighbourhood into separate school and neighbourhood components. Exploiting institutional rules in Montreal that assign students of different linguistic backgrounds to different schools, Laliberté finds that in this context school quality may explain the majority of the causal effect of neighbourhoods on child outcomes.

In many countries, the residential location determines which schools families have access to, making it difficult to distinguish school from neighbourhood effects. School quality can be even more closely tied to neighbourhoods if schools are financed by local taxes, such that schools in disadvantaged areas are less well funded. Pointing to the potential importance of such channels, Chetty et al. 2014a find that areas with higher local tax

⁽¹⁴⁾ A comparison of intergenerational and sibling correlations suggests that siblings share other influences than just the socio-economic status of their parents. Neighbourhood, school and peer effects are leading suspects.

rates have higher rates of upward mobility. National educational policies may therefore affect intergenerational mobility by determining which schools families can access, but also by affecting how closely the quality of schools is tied to the local neighbourhood.

The data requirements to study those questions are high, as we need to observe individual outcomes over long time intervals, to link them to neighbourhood and school characteristics, and to observe an interesting source of variation in those characteristics. With the wider availability of large-scale administrative panel data (see Section 5.2), such research designs are nevertheless becoming more feasible. Many questions will remain even if we can successfully decompose the total exposure effect of an area into a neighbourhood and school component. For example, we may want to know whether the importance of schools stems from the selection of peers into schools or from its institutional quality per se.

4.2 Early Childhood and Childcare

Learning and human capital investments in early childhood may be particularly consequential for intergenerational mobility. First, because of the “complementarity” between investments at different stages in the life cycle: learning at an early age may facilitate learning at later stages (Cunha and Heckman 2007; Heckman 2007). Gaps in cognitive and non-cognitive skills between socio-economic groups open already at early age (Cunha et al. 2006), which may then hinder skill acquisition and educational investments at later age. ⁽¹⁵⁾ Second, because the quality of human capital investments may depend more on family background in early childhood, when parents tend to be more directly involved.

For both reasons, the availability and quality of formal childcare may have important implications for intergenerational mobility. Targeted child care programs, such as the *Head Start* or *Perry Preschool Projects* in the US (targeting children aged 3 or 4), have been shown to generate long-term gains for disadvantaged families, and increasing parents’ own involvement with their children (see Elango et al. 2015 for a survey). Until recently, less was however known about the effects of *universal* childcare (preschool) programs.

Studying a large-scale expansion of subsidised childcare for 3-6 year olds in Norway, Havnes and Mogstad (2015) find that it led to an earnings gain for children from disadvantaged background, whereas upper-class children actually experienced an earning loss, with a net-positive effect on intergenerational income mobility. Cornelissen et al. (forthcoming) exploit the staggered expansion of universal childcare in Germany, which increased the attendance rates of 3-year and (to a lesser degree) 4-year olds, to study how it affects school readiness as captured by a compulsory school entry exam. They likewise find that the benefits of early childcare are particularly pronounced for children from disadvantaged background. Studying a similar expansion in another German state, Felfe and Lalive (2018) show that universal childcare enabled disadvantaged children to catch up with their peers also in terms of socio-emotional maturity.

These results demonstrate that the provision of universal childcare can have positive effects on intergenerational mobility. However, there are potential caveats. First, the impact of formal childcare on intergenerational mobility will depend on its quality, in particular on how that quality varies with parental background. If low-income children are attending systematically poorer quality care, formal childcare may not provide an equal-

⁽¹⁵⁾ This dynamic relation between early and later investments may also arise from behavioural patterns. For example, Restuccia and Urrutia (2004) note that parents tend to have lower earnings when they are young, so that they are at risk of underinvesting in the early education of their children. Consideration of the income profile of parents provides thus another reason why early-childhood investments may increase social mobility more effectively than later investments.

izing role (see Esping-Andersen et al. 2012). Second, children who would benefit from formal childcare may not necessarily participate. Cornelissen et al. (forthcoming) find that in the German case, children with larger potential gains were *less* likely to attend childcare – i.e. there is a reverse selection on gains. A potential explanation for this pattern is that disadvantaged families may systematically underestimate the returns to formal childcare (see also Section 4.5). The public provision of formal childcare in itself may thus not guarantee that it reaches those children who could benefit most from it.

4.3 Educational Systems and Early Track-Choice

How do schools affect intergenerational mobility? Apart from the quality of “inputs”, such as teacher quality (e.g. Chetty et al. 2014), the structure of the educational system may matter for child outcomes. In particular, the literature examined if *early track-choice* – the separation of children by ability into different school tracks at an early age – may harm intergenerational mobility (e.g. Dustmann 2004).

Extensive evidence on this question is available from school reforms that changed the age at which students were separated into different school types. While such sudden policy changes are always useful for evaluation purposes, the evidence is of particularly high quality in this literature because (i) some reforms were implemented gradually across areas, and (ii) the availability of large-scale administrative data allowed researchers to fully exploit these difference in the timing of the reform (see Section 5.2).

For example, Pekkarinen et al. (2009) study the effect of the Finnish comprehensive school reform of 1972 to 1977, which replaced a two-track with a comprehensive school system, postponing the selection of students from age 11 to 16. Pekkarinen et al. find that the reform increased intergenerational mobility in income (i.e. reduced the intergenerational income elasticity by 23%, from an already low baseline of 0.30).

Evidence from similar reforms in the US (Oreopoulos and Page 2006), Sweden (Meghir and Palme, 2005; Holmlund, 2008; Holmlund et al., 2011) and Germany (Piopiunik 2014, Lange and von Werder 2017) likewise suggests that early tracking decreases intergenerational mobility in education, and possibly other outcomes. Consistent with this evidence, cross-country comparisons from international student achievement tests in OECD countries show that early track separation tends to be associated with increased educational inequality (Hanushek and Wößmann 2006).

4.4 Private, Public Education and Credit Constraints

By benefitting children irrespective of family background, the provision of public education may enhance intergenerational mobility. Across developed countries, public expenditures dedicated to non-tertiary or tertiary education as a share of GDP are associated with less income inequality and more income mobility, while the share of private expenditures appears positively correlated with income inequality (Blanden 2009, Ichino et al. 2011 and Rauh 2017). ⁽¹⁶⁾ From a theoretical perspective, public expenditures in education may enhance mobility by crowding out private expenditures, reducing the socio-economic gap in human capital investments.

In addition, the provision of public education may enhance mobility by alleviating *credit constraints*. To understand this argument, note that economic theories frame human

⁽¹⁶⁾ Similarly, public expenditures in education as share of GDP appears positively correlated with income mobility across US states (Mayer and Lopoo 2008), and with educational mobility across Latin American countries (Behrman et al. 2001, Neidhöfer et al. 2017).

capital acquisition as an investment problem, in which investments ought to be made as long as their returns are positive (e.g. in terms of future earnings potential of the child). From this perspective, educational investments into the talented but undereducated children from disadvantaged families should be very profitable. To explain why privately-funded educational systems have low mobility, we thus need to explain why such profitable investments would not be made.

One explanation is the existence of credit constraints. If financial markets are imperfect, low-income families may not be able to borrow against their child's prospective earnings. As a consequence, they might be less likely to send their children to higher education, and less able to finance educational investments at private institutions – even if the expected returns of those investments are high (Becker and Tomes 1986). Mobility would then be higher under public than private education, as for example shown by Solon (2004) or Davies et al. (2005).

The existence of credit constraints can therefore motivate public expenditures or provision of credit for educational purposes. But it is challenging to assess the importance of such constraints empirically, because it is difficult to observe whether families have access to credit or not. While credit constraints appear important in developing countries (e.g. Attanasio and Kaufmann 2009, Solis 2017, Cáceres-Delpiano et al. 2018 and Gamboa and Millán-Quijano 2018), the evidence from developed countries is more mixed. For example, Carneiro and Heckman (2002) and Restuccia and Urrutia (2004) found that few parents are borrowing-constrained with regard to college attainment in the United States.

However, a growing body of evidence based on more recent data indicates that credit constraints do matter, and that higher levels of parental resources do promote child outcomes and mobility also in developed countries (Caucutt and Lochner 2012, Lochner and Monge-Naranjo 2012, Heckman and Mosso 2014). This newer literature suggests that credit constraints are binding not only for the most disadvantaged families, but also for some well-endowed individuals who may find themselves constrained early in their life cycle. This result stems from the complementarity between ability and human capital investments: human capital investments might be more productive for individuals with higher innate abilities (Cunha and Heckman 2007).

4.5 Informational Frictions and Beliefs

Credit constraints are not the only reason why disadvantaged families may underinvest in the human capital and educational attainment of their children. More recent work demonstrates that informational frictions and barriers, and differences in beliefs, are likewise important determinants for investment decisions.

Abbiati and Barone (2017) show that in an Italian sample, students have highly variable and systematically biased beliefs about the profitability of investment in university education, overestimating the returns but also the costs and drop-out risks. Important for socio-economic mobility, students from advantaged family background have more optimistic beliefs about the benefits of university education, even after allowing for their higher objective returns and chances of success.

Rauh and Boneva (forthcoming) conduct a survey of parents of primary and secondary school children in the UK, showing that parental beliefs about the returns to investments vary likewise across the population. Moreover, parental beliefs differ significantly across socio-economic groups, and are predictive of actual investment decisions. Because perceived returns to early parental investments are positively associated with household income, variations in belief may contribute to the intergenerational persistence in income.

Policy interventions which target parental beliefs may therefore be an effective tool to

improve parental investments and child outcomes. An important question for future research is how important these factors are compared to financial aspects. It may be substantially cheaper for policy makers to affect information and beliefs about the benefits of educational choices, than to increase attainment and affect track choice via monetary investments and incentives. Field experiments suggest that students choices are indeed malleable by informational interventions (see Abbiati et al. 2017, Alan et al. 2015).

5 Data and Data Limitations

The data requirements for mobility research are steep. To highlight how important data availability and quality are in this context, we first describe how access to better data over the last two decades has dramatically changed our understanding of income mobility and its determinants. We then identify what limitations the current literature is facing, and discuss what data would be most useful to make future progress on descriptive and causal questions. We compare these needs (“demand”) from researches with the current availability (“supply”) of data in the European and US context.

5.1 Measuring Child and Parent Outcomes

As discussed in Section 2, the estimation of mobility measures typically requires the observation of socio-economic outcomes and identifiers to link family members for at least two generations. ⁽¹⁷⁾ Survey data with retrospective questions, such as EU-SILC or EU-LFS for EU member states, often contain information on educational attainment for two generations, which is also a good proxy for other socio-economic outcomes (see also Section 3.1). But because implementation of these surveys is not centralised, the level of detail captured by the educational variables can vary between EU member states, which may affect comparative work.

Some surveys contain occupational information, which can be used to define the “occupational prestige” or “social class” of a respondent. But occupations do not have an inherent scale, complicating comparisons across countries or time (see Section 2.3). Income has such inherent scale (see Section 2.1), but is more rarely observed in survey data. Even then, typically only a short snapshot of income measured at a particular age is reported. This has turned out to be very problematic for estimation of the intergenerational elasticity and other measures of income mobility, and improvements in data and methodology have led to large revisions in estimates (see Jäntti and Jenkins 2014).

For example, Becker and Tomes (1986) reported estimates of the intergenerational elasticity in the US that centred around 0.2 or lower, suggesting that only up to 20 percent of income advantages were transmitted from parents to children. Becker and Tomes concluded that the United States was a country characterised by high socio-economic mobility, an erroneous belief that lingered until Solon (1992) and others demonstrated – based on better data and improved methodology – that the income elasticity is instead around 0.4 or higher (see Solon 1999 and Haider and Solon 2006). It turned out that the US are characterised by low socio-economic mobility, much lower than suggested by previous work, and lower than in most other developed countries.

⁽¹⁷⁾ Sibling correlations are an alternative measure of the importance of family background, which can be estimated without observation of socio-economic outcomes for the parent generation (see Section 2.4). However, the identification of siblings still requires identification of parents. Recently, researchers have used surnames or even first names to identify ancestors directly or in a probabilistic sense (Collado et al. 2012, Clark 2014, Güell et al. 2015 or Olivetti and Paserman 2015). The considerable effort invested in such creative workarounds reflects the severity of data limitations in this literature.

This example illustrates how a lack of high-quality data sources has impeded mobility research in the past. But many measurement problems remain even today, see for example Nybom and Stuhler (2017) and Gregg et al. 2017. The level of mobility is still not precisely estimated for many countries (see also Section 3.1), and some authors argue that the intergenerational elasticity in the US is in fact closer to 0.6 than 0.4 (Mazumder 2016). These measurement problems are even more severe for research on mobility trends, as they make it difficult to detect more gradual shifts over time. Indeed, the evidence on mobility trends is quite inconclusive for many countries (see Section 3.3).

While data quality is the main problem, better data will not fully solve the problem, as the late-career status can be never observed for the more recent cohorts. The literature, in particular the strand of literature studying income mobility, requires therefore improvements in both methodology and data. Apart from the general need for better data, a few specific trends are readily observed. Because the *quantity* of educational attainment stabilises in many countries, the horizontal differentiation of educational careers – i.e. in terms of field of study or institutional quality – becomes more central (see Section 2.2).

Moreover, interest has turned on the socio-economic status of family members other than parents, which can be informative about the long-run transmission of economic advantages and its underlying mechanisms (see Section 2.4). It would therefore be advantageous if surveys would elicit status information not only on parents and children, but also other types of relatives, such as siblings, cousins or grandparents.

While survey data will continue to play an important role in the literature, they are subject to fundamental constraints that are likely to limit their importance for future research. This hypothesis is supported by recent trends in mobility research and the social sciences more generally, which are discussed in the next section.

5.2 Administrative Data Sources

Administrative data sources are becoming increasingly important for the social sciences (Card et al. 2010). Their scale allows researchers to answer questions that previously could not be studied, and to re-evaluate existing questions with more compelling approaches and evidence (Figlio et al. 2017). The shift has been particularly pronounced in the intergenerational literature. This observation is illustrated in Table 3, which reports the main data sources in articles on intergenerational mobility that were published in the five leading economic journals over the last decade. ⁽¹⁸⁾ Apart from one, *all* articles were based on large-scale data from census or administrative sources. This pattern is in stark contrast to previous decades, in which the vast majority of empirical work in those journals was survey-based. ⁽¹⁹⁾ This shift mirrors the trend in other branches of economics, and other fields of the social sciences. In the intergenerational context, the reasons include:

1. Increasing standards for causal analysis, which favour large data sources that allow researchers to exploit variation across subgroups. For example, Chetty et al. (2014a) and Chetty and Hendren (2016) study differences in mobility across areas *within* a given country, in contrast to previous work on mobility differentials *between* countries (see also Section 4.1). The switch to a within-country research design yields two key advantages: i) we observe many more data points, and the institutional and policy environment is more stable within than between countries; ii) by tracking families who move between areas (e.g. Chetty and Hendren 2016), or

⁽¹⁸⁾ These five journals have a strong influence on research in economics (see Card and DellaVigna 2013).

⁽¹⁹⁾ See for example Chetty, R.: "Time Trends in the Use of Administrative Data for Empirical Research". Cambridge, MA: NBER Summer Institute, July 2012.

by studying policies and rare events that affect some areas but not others (Pekkarinen et al. 2009), we might identify causal relationships of interest (see Sections 4.2 and 4.3 for examples).

2. An interest in long-run effects, which may require the tracking of individuals over time, space, and data sources. Many administrative sources are longitudinal in nature, and designed to reliably track individuals irrespective of their current location. Moreover, as they often cover the entire population, individuals could in principle be followed from one source to another. The literature on universal child care reviewed in Section 4.2 provides one illustration: while the effect of educational policies on educational outcomes is interesting, we ultimately care also about their impact on labour market and socio-economic outcomes. But to survey individuals from childhood to their entrance in the labour market would be costly, and fraught with sample attrition.
3. An interest in the heterogeneity of an effect. With a large number of observations, it becomes possible to study causal effects or statistical relationships in the extremes of the distribution – for example the most disadvantaged families, or the top one percent of the income distribution – which are often of particular interest in mobility research. Administrative sources allow us to describe these relationships in much more details. For example, inequality appears more persistent in the bottom and very top of the income distribution in Sweden (Björklund et al. 2012; Nybom and Stuhler 2017), and children from parents with particularly low earnings have recently fallen behind in various quality-of-life outcomes in Norway (Markussen and Røed 2017).
4. An interest in how persistent socio-economic inequalities really are. As described in Section 2.4, parent-child correlations may not reveal the full extent of intergenerational transmission, as inequalities across three or four generations appear more persistent than the extrapolation from those parent-child correlations would suggest (e.g. Lindahl et al. 2015, Braun and Stuhler 2018). This observation is in line with a prior literature on sibling correlations, which suggests that siblings share other influences than just the socio-economic status of their parents (e.g. Solon et al. 1991, Björklund and Jäntti 2012; Björklund et al. 2010). In administrative data covering the full population, it is feasible to obtain more direct evidence from many different types of relatives, including distant ones. For example, Adermon et al. (2016) consider distant cousins and uncles to demonstrate that inequality is more persistent than parent-child correlations suggest.

Administrative data have many other benefits. ⁽²⁰⁾ Of course, survey data have advantages, too. Our descriptive evidence on intergenerational mobility across countries and time is still largely based on surveys (see Section 2), and improvements in survey data have led to significant changes in our understanding of intergenerational mobility and its drivers. The coding of central variables in surveys may be more useful for scientific purposes (e.g. Mazumder 2016), and they can elicit information on questions that would not be collected in administrative sources, such as attitudes and expectations. The recent literature on the importance of parental beliefs illustrates how valuable survey data can be in this respect (see Section 4.5).

However, because survey data fall short in the four central dimensions listed above, their use is likely to remain restricted. Moreover, capacity constraints in the use of administrative data – estimations on population-wide data can be computationally intensive – have become less binding because of rapid technical progress. In contrast, it remains very costly to survey large parts of the population, and large-scale surveys tend to have few observations on parental background. These problems are structural and cannot be well

⁽²⁰⁾ Such as higher quality and less attrition (due to their mandatory nature), economies of scale, their potential complementarity to survey and field experiments, and so on (see Card et al. 2010 and Figlio et al. 2017).

addressed by redesigning or improving existing surveys. The shift to administrative sources for research purposes is therefore likely to be permanent. However, this shift creates many technical and legal challenges, and concerns about data security and confidentiality.

Only some European countries have developed transparent and merit-based procedures to enable access to data (see Card et al. 2010). Administrative data are collected for administrative purposes, and key stakeholders have rarely an inherent interest in making these data accessible to researchers. In addition, there are important technical (some countries lack central identification numbers) and legal hurdles. Certain EU member states do not make data available to researchers from other member states, provide inferior versions of the data, or grant access only via remote facilities that are more cumbersome to use than the type of access granted to own citizens and institutions. Access restrictions because of confidentiality and security concerns tend to work against young researchers, who may lack the necessary contacts or credentials.

Table 3: Intergenerational Mobility Studies in Top-5 Journals in Economics, 2008-2018

Author	Year	Title	Journal	Data Type	Countries
Chetty and Hendren	2018	The Impacts of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects	QJE	Administrative	United States
Alesina, Stantcheva and Teso	2018	Intergenerational Mobility and Preferences for Redistribution	AER	Administrative and Survey	France, Italy, Sweden, UK and US
Cesarini, Lindqvist, Östling and Wallace	2016	Wealth, Health, and Child Development: Evidence from Administrative Data on Swedish Lottery Players	QJE	Administrative	Sweden
Bleakley and Ferrie	2016	Shocking Behavior Random Wealth in Antebellum Georgia and Human Capital Across Generations	QJE	Census	United States
Chetty, Hendren and Katz	2016	The Effects of Exposure to Better Neighborhoods on Children: New Evidence [...]	AER	Administrative and Survey	United States
Olivetti and Paserman	2015	In the Name of the Son (and the Daughter): Intergenerational Mobility in the United States, 1850–1940	AER	Census	United States
Güell, Rodríguez Mora and Telmer	2015	The Informational Content of Surnames, the Evolution of Intergenerational Mobility, and Assortative Mating	RESTUD	Census and Phone Directory	Spain
Dahl, Kostøl and Mogstad	2014	Family Welfare Cultures	QJE	Administrative	Norway
Chetty, Hendren, Kline and Saez	2014	Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States	QJE	Administrative	United States
Long and Ferrie	2013	Intergenerational Occupational Mobility in Great Britain and the United States Since 1850	AER	Census	United States and Great Britain

Lefgren, Lindquist and Sims	2012	Rich Dad, Smart Dad: Decomposing the Intergenerational Transmission of Income	JPE	Administrative	Sweden
Munshi	2011	Strength in Numbers: Networks as a Solution to Occupational Traps	RESTUD	Survey	India
Edlund and Kopczuk	2009	Women, Wealth, and Mobility	AER	Administrative	United States

Notes: The table lists articles on intergenerational mobility from the *Quarterly Journal of Economics* (QJE), *Journal of Political Economy* (JPE), *Econometrica* (ECTA), *American Economic Review* (AER, without *Papers & Proceedings*) and the *Review of Economic Studies* (RESTUD) that were published between 2008 and 2017. The list is based on database searches using the keyword "intergenerational mobility".

Perhaps the most important requirement for intergenerational research is the ability to link family members (ideally including distant ones, see Section 2.4), which is lacking in many EU member states. For example, de-identified data based on social security records are available in Germany, but it has not been possible to link family members. Perhaps as a result, the literature has seen few contributions from German sources (see also Table 3). Another major limitation is the tendency of the relevant stakeholders to only make small fractions of the population-wide data accessible to researchers, and to coarsen the definition of regional identifiers in the "scientific use" versions of the data. Because causal research has shifted towards research designs that exploit spatial variation on a fine geographic level (see also Section 4), sample size and geographic classifiers have become important bottlenecks, even in scientific use files from administrative sources.

6 Conclusions and Outlook

Research on intergenerational mobility has yielded many interesting descriptive and causal insights. Recent developments on the descriptive side include the observation that achievement gaps by socio-economic background open very early in life, that the extent of socio-economic mobility varies not only on the national but also sub-national level, and that it appears negatively correlated with income inequality on both the national and sub-national level. Moreover, a nascent strand of research on *multigenerational* mobility suggests that inequalities are more persistent than a naive interpretation from parent-child correlations would suggest. If parent-child associations provide only an incomplete picture of the extent of mobility, they might provide only a limited perspective on how mobility varies across countries, groups or time.

The literature has also branched into less traditional themes, such as the question if beliefs and attitudes vary systematically with socio-economic background, and if these beliefs are predictive of educational decisions. However, many challenges remain. For example, while the literature has uncovered important shifts in mobility over longer time spans, the evidence on more recent periods appears more mixed. The question if mobility is going up or down seems simple enough, but the lack of high-quality data sources makes it difficult to detect gradual mobility trends in many countries, including many EU member states.

These descriptive insights have in turn steered research on the determinants of intergenerational processes. This report focused on research related to educational systems and policies within five broader themes: (i) neighbourhoods and schools, (ii) early childhood and childcare, (iii) educational systems and track choice, (iv) private and public

education, and (v) informational frictions and beliefs. It argued that the relation between mobility and at least some institutional aspects are fairly well understood.

For example, the provision of early childcare to children from disadvantaged background can raise mobility, while the separation of children into different school tracks according to their observed ability appears to diminish mobility. These findings matter with respect to evidence showing that achievement gaps in early life, which has shifted focus on educational policies that affect young children. More generally, the literature asks how important neighbourhoods and schools are for child development, and future research will aim to identify which neighbourhood and area characteristics are particularly conducive for upward intergenerational mobility.

Data requirements for mobility research are steep, and the report reviewed the main requirements and limitations that researchers face. Much of the recent causal evidence is based on research designs that exploit fine-grained variations, such as policy variation that affects children in some areas but not others. Such research designs are feasible only in large-scale samples, explaining the strong shift away from survey and towards administrative data sources. This shift has already produced exciting new insights, which are likely to shape the field for years to come. ⁽²¹⁾

But the shift towards administrative data also produces challenges, given the confidential nature of those data. In Europe, the Nordic countries have excelled at making high-quality administrative sources available for research purposes, providing a large boost to the quality of research on intergenerational mobility and many other literatures. But only few EU member states have similarly transparent and merit-based access procedures in place, and other sources lack the type of family identifiers that are required for intergenerational research. Many data resources have therefore remained untapped, and data limitations remain one of the most important bottlenecks for mobility research.

A particular obstacle in the European context is that because of various reasons, administrative sources are often accessible only on-site at the national stakeholder, and/or only to citizens and institutions from the respective country. This compartmentalisation of data and researchers hinders the dissemination of knowledge and collaborations across national borders. Some national stakeholders have begun to tackle this problem. For example, the Research Data Centre of the German Federal Employment Agency has established several remote data centres to enable secure access from other countries (see Bender and Heining 2011). These particular centres are located in the US and UK, but the creation of similar secure facilities to enable cross-border access within the EU would be highly desirable. ⁽²²⁾

Apart from access, the most important single limitation for mobility research is the fact that administrative records can often not be linked between family members – even in countries where such records are in principle available, as for example in Germany or Spain. However, by cross-linking different variables or sources it is often possible to reconstruct such links, and therefore to activate the potential of large-scale administrative data for mobility research. For example, researchers in the US have recently linked millions of children with their parents' tax records in the US, paving the way for some of the most influential studies on intergenerational mobility in recent years (see Section 5.2 and Table 3). Similar initiatives could unlock the full potential of administrative sources for research purposes also in EU member states.

Finally, mobility research would profit greatly from the linkage of *historical census data*,

⁽²¹⁾ This shift and the need for better access to administrative sources is also described in Card et al. 2010 for the US and Crato (2017) for Europe.

⁽²²⁾ A European-wide initiative would presumably be more effective than bilateral solutions initiated by each individual national stakeholder. Initiatives such as "Data without Boundaries" have led some of the groundwork, preparing metadata and more harmonized transnational accreditation (see www.dwbproject.org).

whose vast scale have made them an important data source in the recent literature (see Section 5.2 and Table 3). While census data lack the panel dimension, researchers have developed methods for the automatic linkage of census records based on names, addresses or other information. These methods can be improved further by the application of innovative machine-learning techniques. In the United States, a large-scale project is currently underway to link censuses from 1850 to the present, which will enable investigators to trace the transmission of demographic and socio-economic characteristics over up to seven generations (see Ruggles, Fitch and Sobek, 2017). Such data will be invaluable for research on mobility trends, the persistence of inequalities across generations, and other questions. The potential for economies of scale with respect to development of linkage technologies speak in favour of a European-wide project to support such efforts.

References

- Aaronson, D., and B. Mazumder (2008): "Intergenerational Economic Mobility in the United States, 1940 to 2000," *Journal of Human Resources*, 43(1).
- Abbiati, G., G. Argentin, C. Barone, and A. Schizzerotto (2017): "Information Barriers and Social Stratification in Higher Education: Evidence from a Field Experiment," *The British Journal of Sociology*.
- Abbiati, G., and C. Barone (2017): "Is University Education Worth the Investment? The Expectations of Upper Secondary School Seniors and the Role of Family Background," *Rationality and Society*, 29(2), 113–159.
- Adermon, A., M. Lindahl, and M. Palme (2016): "Dynastic Human Capital, Inequality and Intergenerational Mobility," Discussion paper, mimeo, Uppsala University.
- Alan, S., T. Boneva, and S. Ertac (2015): "Ever Failed, Try Again, Succeed Better: Results from a Randomized Educational Intervention on Grit," Working Papers 2015-009, Human Capital and Economic Opportunity Working Group.
- Anderson, L. R., P. Sheppard, and C. W. S. Monden (2018): "Grandparent Effects on Educational Outcomes: A Systematic Review," *Sociological Science*.
- Atkinson, A. (1980): "On Intergenerational Income Mobility in Britain," *Journal of Post Keynesian Economics*, 3(2), 194–218.
- Atkinson, A. B., T. Piketty, and E. Saez (2011): "Top Incomes in the Long Run of History," *Journal of Economic Literature*, 49(1), 3–71.
- Attanasio, O., and K. Kaufmann (2009): "Educational Choices, Subjective Expectations, and Credit Constraints," NBER Working Papers 15087, National Bureau of Economic Research, Inc.
- Autor, D., and L. Katz (1999): "Changes in the Wage Structure and Earnings Inequality," in *Handbook of Labor Economics*, ed. by O. C. Ashenfelter, and D. Card, vol. 3, pp. 1463–1555. North-Holland.
- Barone, G., and S. Mocetti (2016): "Intergenerational Mobility in the Very Long Run: Florence 1427-2011," *Temi di discussione (Economic working papers) 1060*, Bank of Italy, Economic Research and International Relations Area.
- Becker, G., and N. Tomes (1979): "An Equilibrium Theory of the Distribution of Income and Intergenerational Mobility," *The Journal of Political Economy*, 87(6), 1153–1189.
- (1986): "Human Capital and the Rise and Fall of Families," *Journal of Labor Economics*, 4(3), 1–39.
- Behrman, J. R., A. Gaviria, and M. Székely (2001): "Intergenerational Mobility in Latin America," Research Department Publications 4267, Inter-American Development Bank, Research Department.
- Beller, E., and M. Hout (2006): "Welfare States and Social Mobility: How Educational and Social Policy May Affect Cross-National Differences in the Association Between Occupational Origins and Destinations," *Research in Social Stratification and Mobility*, 24(4), 353–365.
- Bello, S. L., and I. Morchio (2018): "Like Father, Like Son: Occupational Choice, Intergenerational Persistence and Misallocation," Discussion paper, mimeo, Universidad Carlos III de Madrid, Department of Economics.

- Bender, S., and J. Heining (2011): "The Research-Data-Centre in Research-Data-Centre approach: a first step towards decentralised international data sharing", FDZ Methodenreport, Institut für Arbeitsmarkt- und Berufsforschung (IAB), Nürnberg.
- Bingley, P., L. Cappellari, and K. Tatsiramos (2017): "Family, Community and LifeCycle Earnings: Evidence from Siblings and Youth Peers," Discussion Paper 6743, CE-Sifo Working Paper.
- Björklund, A., and M. Jäntti (2009): "Intergenerational Income Mobility and the Role of Family Background," in *Oxford Handbook of Economic Inequality*, ed. by B. N. Salverda Wiemer, and T. M. Smeeding. Oxford University Press.
- (2012): "How Important is Family Background for Labor-economic Outcomes?," *Labour Economics*, 19(4), 465–474.
- Björklund, A., M. Jäntti, and M. J. Lindquist (2009): "Family Background and Income During the Rise of the Welfare State: Brother Correlations in Income for Swedish Men born 1932-1968," *Journal of Public Economics*, 93(5-6), 671 – 680.
- Björklund, A., L. Lindahl, and M. J. Lindquist (2010): "What More Than Parental Income, Education and Occupation? An Exploration of What Swedish Siblings Get from Their Parents," *The B.E. Journal of Economic Analysis & Policy*, 10(1), 102.
- Björklund, A., M. Lindahl, and E. Plug (2006): "The Origins of Intergenerational Associations: Lessons from Swedish Adoption Data," *Quarterly Journal of Economics*, 121(3), 999–1029.
- Björklund, A., J. Roine, and D. Waldenström (2012): "Intergenerational Top Income mobility in Sweden: Capitalist Dynasties in the Land of Equal Opportunity?," *Journal of Public Economics*, 96(5), 474–484.
- Black, S. E., and P. Devereux (2011): "Recent Developments in Intergenerational Mobility," in *Handbook of Labor Economics*, ed. by O. Ashenfelter, and D. Card, vol. 4A. Elsevier.
- Black, S. E., P. J. Devereux, P. Lundborg, and K. Majlesi (2015): "Poor Little Rich Kids? The Determinants of the Intergenerational Transmission of Wealth," NBER Working Paper 21409, National Bureau of Economic Research.
- Blanden, J. (2009): "How Much Can We Learn From International Comparisons of Intergenerational Mobility?," Discussion Paper 111, Centre for the Economics of Education, London School of Economics and Political Science.
- (2011): "Cross-Country Rankings in Intergenerational Mobility: A Comparison of Approaches from Economics and Sociology," *Journal of Economic Surveys*.
- Blanden, J., A. Goodman, P. Gregg, and S. Machin (2004): "Changes in Intergenerational Mobility in Britain," in *Generational Income Mobility in North America and Europe*, pp. 122–46. Cambridge University Press.
- Blanden, J., P. Gregg, and L. Macmillan (2007): "Accounting for Intergenerational Income Persistence: Noncognitive Skills, Ability and Education," *Economic Journal*, 117(519), C43–C60.
- (2012): "Intergenerational Persistence in Income and Social Class: The Effect of WithinGroup Inequality," *Journal of the Royal Statistical Society: Series A*.
- Blanden, J., and S. Machin (2007): "Recent Changes in Intergenerational Mobility in Britain," in Report for the Sutton Trust.
- Boserup, S. H., W. Kopczuk, and C. T. Kreiner (2016): "The Role of Bequests in Shaping Wealth Inequality: Evidence from Danish Wealth Records," *American Economic Review*, 106(5), 656–61.

- Bowles, S. (1972): "Schooling and Inequality from Generation to Generation," *Journal of Political Economy*, 80(3), S219–S51.
- Bratberg, E., Ø. A. Nilsen, and K. Vaage (2007): "Trends in Intergenerational Mobility across Offspring's Earnings Distribution in Norway," *Industrial Relations: A Journal of Economy and Society*, 46(1), 112–129.
- Bratsberg, B., K. Roed, O. Raaum, R. Naylor, M. Jantti, and T. Eriksson (2007): "Non-linearities in Intergenerational Earnings Mobility: Consequences for Cross-Country Comparisons," *Economic Journal*, 117(519), C72–C92.
- Braun, S. T., and J. Stuhler (2018): "The Transmission of Inequality Across Multiple Generations: Testing Recent Theories with Evidence from Germany," *The Economic Journal*, 128(609), 576–611.
- Breen, R. and R. Luijkx (2004): "Social Mobility in Europe between 1970 and 2000," in *Social Mobility in Europe*, ed. by R. Breen, pp. 37–75. Oxford University Press.
- Breen, R., R. Luijkx, W. Müller, and R. Pollak (2009): "Nonpersistent Inequality in Educational Attainment: Evidence from Eight European Countries," *American Journal of Sociology*, 114(5), pp. 1475–1521.
- Bütikofer, A., A. D. Zuenna, and K. Salvanes (2016): "Natural Resource Booms and Intergenerational Mobility," Discussion paper, mimeo, NHH Bergen.
- Cáceres-Delpiano, J., E. Giolito, and S. Castillo (2018): "Early Impacts of College Aid," *Economics of Education Review*.
- Card, D., R. Chetty, M. Feldstein, and E. Saez (2010): "Expanding Access to Administrative Data for Research in the United States," Discussion paper, Washington, DC: National Science Foundation White Paper No. 10–069.
- Card, D., and S. DellaVigna (2013): "Nine Facts about Top Journals in Economics," NBER Working Papers 18665, National Bureau of Economic Research, Inc.
- Carneiro, P., and J. Heckman (2002): "The Evidence on Credit Constraints in Post-secondary Schooling," *Economic Journal*, 112(482), 705–734.
- Carneiro, P., and J. Heckman (2003): "Human Capital Policy," in *Inequality in America: What role for human capital policies?*, ed. by J. Heckman, A. Krueger, and B. Friedman. Cambridge, MA: MIT Press.
- Caucutt, E. M., and L. Lochner (2012): "Early and Late Human Capital Investments, Borrowing Constraints, and the Family," NBER Working Papers 18493, National Bureau of Economic Research, Inc.
- Cesarini, D., E. Lindqvist, R. Östling, and B. Wallace (2016): "Wealth, Health, and Child Development: Evidence from Administrative Data on Swedish Lottery Players *," *The Quarterly Journal of Economics*, 131(2), 687–738.
- Chan, T. W., and V. Boliver (2013): "The Grandparents Effect in Social Mobility: Evidence from British Birth Cohort Studies," *American Sociological Review*, 78(4), 662–678.
- Checchi, D., A. Ichino, and A. Rustichini (1999): "More Equal But Less Mobile?: Education Financing and Intergenerational Mobility in Italy and in the US," *Journal of Public Economics*, 74(3), 351–393.
- Chetty, R., J. N. Friedman, and J. E. Rockoff (2014): "Measuring the Impacts of Teachers II: Teacher Value-Added and Student Outcomes in Adulthood," *American Economic Review*, 104(9), 2633–79.
- Chetty, R., J. N. Friedman, E. Saez, N. Turner, and D. Yagan (2017): "Mobility Report Cards: The Role of Colleges in Intergenerational Mobility," NBER Working Papers 23618, National Bureau of Economic Research.

- Chetty, R., and N. Hendren (2016): "The Impacts of Neighborhoods on Intergenerational Mobility I: Childhood Exposure Effects," NBER Working Papers 23001, National Bureau of Economic Research, Inc.
- Chetty, R., N. Hendren, and L. F. Katz (2016): "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment," *American Economic Review*, 106(4), 855–902.
- Chetty, R., N. Hendren, P. Kline, and E. Saez (2014a): "Where is the Land of Opportunity? The Geography of Intergenerational Mobility in the United States," *Quarterly Journal of Economics*, 129(4), 1553–1623.
- Chetty, R., N. Hendren, P. Kline, E. Saez, and N. Turner (2014b): "Is the United States Still a Land of Opportunity? Recent Trends in Intergenerational Mobility," *American Economic Review: Papers and Proceedings*, 104(5), 141–47.
- Clark, G. (2014): *The Son Also Rises: Surnames and the History of Social Mobility*. Princeton University Press.
- Clark, G., and N. Cummins (2012): "What is the True Rate of Social Mobility? Surnames and Social Mobility, England 1800-2012," Unpublished working paper.
- Connolly, M., M. Corak, and C. Haecck (2017): "Intergenerational Income Mobility in Canada and the United States," Discussion paper, mimeo.
- Corak, M. (2013): "Income Inequality, Equality of Opportunity, and Intergenerational Mobility," *Journal of Economic Perspectives*, 27(3), 79–102.
- Corak, M., M. J. Lindquist, and B. Mazumder (2014): "A Comparison of Upward and Downward Intergenerational Mobility in Canada, Sweden and the United States," *Labour Economics*.
- Corak, M., and P. Piraino (2010): "The Intergenerational Transmission of Employers," *Journal of Labor Economics*, 29(1), 37–68.
- Cornelissen, T., C. Dustman, A. Raute, and U. Schönberg (forthcoming): "Who benefits from universal child care? Estimating marginal returns to early child care attendance," *Journal of Political Economy*.
- Crato, N. (2017): "A call to action for better data and better policy evaluation: A briefing on the importance of administrative data for social knowledge and policy evaluation, at Big Data times," JRC Science for Policy report.
- Cunha, F., and J. Heckman (2007): "The Technology of Skill Formation," *American Economic Review*, 97(2), 31–47.
- Cunha, F., J. Heckman, L. Lochner, and D. Masterov (2006): "Interpreting the Evidence on Life Cycle Skill Formation," in *Handbook of the Economics of Education*, vol. 1, chap. 12. Elsevier B.V.
- Dahl, G. B., A. R. Kostøl, and M. Mogstad (2014): "Family Welfare Cultures," *The Quarterly Journal of Economics*, 129(4), 1711–1752.
- Davies, J. B., J. Zhang, and J. Zeng (2005): "Intergenerational Mobility under Private vs. Public Education," *Scandinavian Journal of Economics*, 107(3), 399–417.
- Deutscher, N. (2018): "Place, Jobs, Peers and the Importance of the Teenage Years: Exposure Effects and Intergenerational Mobility," Discussion paper, mimeo, Australian National University.
- Dohmen, T., A. Falk, D. Huffman, and U. Sunde (2012): "The Intergenerational Transmission of Risk and Trust Attitudes," *The Review of Economic Studies*, 79(2), 645–677.
- Duncan, O. D. (1969): "Contingencies in Constructing Causal Models," *Sociological Methodology*, 1, 74–112.

- Durlauf, S. (2004): "Neighborhood Effects," in Handbook of Regional and Urban Economics, ed. by J. V. Henderson, and J. F. Thisse, vol. 4, chap. 50, pp. 2173–2242. Elsevier, 1 edn.
- Durlauf, S., and A. Seshadri (2017): "Understanding the Great Gatsby Curve," in NBER Macroeconomics Annual 2017, volume 32, NBER Chapters. National Bureau of Economic Research, Inc.
- Dustmann, C. (2004): "Parental Background, Secondary School Track Choice, and Wages," Oxford Economic Papers, 56(2), 209–230.
- Eisenhauer, P., and F. Pfeiffer (2008): "Assessing Intergenerational Earnings Persistence Among German Workers," Discussion Paper No. 08-014, Centre for European Economic Research (ZEW), Mannheim, Germany.
- Elango, S., J. L. García, J. J. Heckman, and A. Hojman (2015): "Early Childhood Education," Working Paper 21766, National Bureau of Economic Research.
- Erikson, R., and J. Goldthorpe (1992): The Constant Flux: A Study of Class Mobility in Industrial Societies. Oxford University Press, USA.
- (2010): "Has Social Mobility in Britain Decreased? Reconciling Divergent Findings on Income and Class Mobility," The British Journal of Sociology, 61(2), 211–230.
- Ermisch, J., M. Francesconi, and T. Siedler (2006): "Intergenerational Mobility and Marital Sorting," The Economic Journal, 116(513), 659–679.
- Ermish, J., and M. Francesconi (2002): "Intergenerational Mobility in Britain: New Evidence From the BHPS," Generational income mobility in North America and Europe (Cambridge University Press: Cambridge).
- Esping-Andersen, G., I. Garfinkel, W.-J. Han, K. Magnuson, S. Wagner, and J. Waldfogel (2012): "Child Care and School Performance in Denmark and the United States," Children and Youth Services Review, 34(3), 576–589.
- Felfe, C., and R. Lalive (2018): "Does Early Child Care Help or Hinder Child Development?," Journal of Public Economics.
- Fernández, R., and R. Rogerson (2001): "Sorting and Long-Run Inequality," The Quarterly Journal of Economics, 116(4), 1305–1341.
- Ferreira, F. H. G., and J. Gignoux (2011): "The Measurement of Inequality of Opportunity: Theory And An Application To Latin America," Review of Income and Wealth, 57(4), 622–657.
- Figlio, D., K. Karbownik, and K. Salvanes (2017): "The Promise of Administrative Data in Education Research," Education Finance and Policy, 12(2), 129–136.
- Gamboa, L. F., and J. Millán-Quijano (2018): "Reducing Credit Constraints to Post Secondary Technical Education in Developing Countries: Evidence from Colombia," Discussion paper, UC3M Working papers 18-02.
- Goldberger, A. S. (1972): "Structural Equation Methods in the Social Sciences," Econometrica, 40(6), 979–1001.
- Goldthorpe, J. H. (2013): "Understanding – and Misunderstanding – Social Mobility in Britain: The Entry of the Economists, the Confusion of Politicians and the Limits of Educational Policy," Journal of Social Policy, 42(03), 431–450.
- Greenwood, J., N. Guner, G. Kocharkov, and C. Santos (2014): "Marry Your Like: Assortative Mating and Income Inequality," American Economic Review: Papers and Proceedings, 104(5), 348–53.
- Güell, M., M. Pellizzari, G. Pica, and J. V. R. Mora (2016): "Correlating Social Mobility and Economic Outcomes," Discussion paper, mimeo, University of Edinburgh.

- Haider, S., and G. Solon (2006): "Life-Cycle Variation in the Association between Current and Lifetime Earnings," *American Economic Review*, 96(4), 1308–1320.
- Hanushek, E. A., and L. Wößmann (2006): "Does Educational Tracking Affect Performance and Inequality? Differences-in-Differences Evidence Across Countries," *Economic Journal*, 116(510), C63–C76.
- Havnes, T., and M. Mogstad (2015): "Is Universal Child Care Levelling the Playing Field?," *Journal of Public Economics*, 127, 100 – 114, The Nordic Model.
- Heckman, J. J. (2007): "The Economics, Technology, and Neuroscience of Human Capability Formation," *Proceedings of the National Academy of Sciences*, 104(33), 13250–13255.
- Heckman, J. J., and S. Mosso (2014): "The Economics of Human Development and Social Mobility," *Annual Review of Economics*, 6, 689–733.
- Heidrich, S. (2016): "Essays on Intergenerational Income Mobility, Geographical Mobility, and Education," Umeå Economic Studies 932, Umeå University, Department of Economics.
- Hertz, T. (2007): "Trends in the Intergenerational Elasticity of Family Income in the United States," *Industrial Relations*, 46(1), 22–50.
- Hertz, T., T. Jayasundera, P. Piraino, S. Selcuk, N. Smith, and A. Verashchagina (2008): "The Inheritance of Educational Inequality: International Comparisons and Fifty-Year Trends," *The B.E. Journal of Economic Analysis & Policy*, 7(2), 1–48.
- Holmlund, H. (2008): "Intergenerational Mobility and Assortative Mating: Effects of an Educational Reform," Cee discussion paper 91, Centre for the Economics of Education.
- Holmlund, H., M. Lindahl, and E. Plug (2011): "The Causal Effect of Parents' Schooling on Children's Schooling: A Comparison of Estimation Methods," *Journal of Economic Literature*, 49(3), 615–51.
- Hout, M. (2015): "A Summary of What We Know about Social Mobility," *The ANNALS of the American Academy of Political and Social Science*, 657(1), 27–36.
- Ichino, A., L. Karabarbounis, and E. Moretti (2011): "The Political Economy Of Intergenerational Income Mobility," *Economic Inquiry*, 49(1), 47–69.
- Inoue, A., and G. Solon (2010): "Two-Sample Instrumental Variables Estimators," *The Review of Economics and Statistics*, 92(3), 557–561.
- Jäntti, M., B. Bratsberg, K. Røed, O. Raaum, R. Naylor, E. Österbacka, A. Björklund, and T. Eriksson (2006): "American Exceptionalism in a New Light: A Comparison of Intergenerational Earnings Mobility in the Nordic Countries, the United Kingdom and the United States," IZA Discussion Papers 1938, Institute for the Study of Labor (IZA).
- Jäntti, M., and S. P. Jenkins (2014): "Income Mobility," in *Handbook of Income Distribution*, ed. by A. B. Atkinson, and F. Bourguignon, vol. 2. Elsevier.
- Jenkins, S. (1987): "Snapshots versus Movies: 'Lifecycle biases' and the Estimation of Intergenerational Earnings Inheritance," *European Economic Review*, 31(5), 1149–1158.
- Jonsson, J. O., D. B. Grusky, M. D. Carlo, R. Pollak, and M. C. Brinton (2009): "Micro-class Mobility: Social Reproduction in Four Countries," *American Journal of Sociology*, 114(4), pp. 977–1036.
- Kim, C., C. R. Tamborini, and A. Sakamoto (2015): "Field of Study in College and Lifetime Earnings in the United States," *Sociology of Education*, 88(4), 320–339.

- Labiberté, J.-W. P. (2017): "Long-term Contextual Effects in Education: Schools and Neighborhoods," Discussion paper, mimeo, University of Toronto.
- Landerso, R., and J. J. Heckman (2016): "The Scandinavian Fantasy: The Sources of Intergenerational Mobility in Denmark and the U.S.," IZA Discussion Papers 10000, Institute for the Study of Labor (IZA).
- Lange, S., and M. von Werder (2017): "Tracking and the Intergenerational Transmission of Education: Evidence from a Natural Experiment," *Economics of Education Review*, 61, 59–78.
- Lee, C.-I., and G. Solon (2009): "Trends in Intergenerational Income Mobility," *The Review of Economics and Statistics*, 91(4), 766–772.
- Lefranc, A., F. Ojima, and T. Yoshida (2008): "The Intergenerational Transmission of Income and Education: A Comparison of Japan and France," EUI Working Papers RSCAS 2008/25, European University Institute, Robert Schuman Centre for Advanced Studies.
- Levine, D. I., and B. Mazumder (2007): "The Growing Importance of Family: Evidence from Brothers' Earnings," *Industrial Relations: A Journal of Economy and Society*, 46(1), 7–21.
- Lindahl, M., M. Palme, S. Sandgren Massih, and A. Sjögren (2015): "Long-term Intergenerational Persistence of Human Capital: An Empirical Analysis of Four Generations," *Journal of Human Resources*, 50(1), 1–33.
- Lochner, L., and A. Monge-Naranjo (2012): "Credit Constraints in Education," *Annual Review of Economics*, 4(1), 225–256.
- Løken, K. V., M. Mogstad, and M. Wiswall (2012): "What Linear Estimators Miss: The Effects of Family Income on Child Outcomes," *American Economic Journal: Applied Economics*, 4(2), 1–35.
- Ludwinek, A., R. Anderson, D. Ahrendt, J.-M. Jungblut, and T. Leončikas (2017): "Social Mobility in the EU," Discussion Paper, Publications Office of the European Union, Luxembourg.
- Mare, R. (2011): "A Multigenerational View of Inequality," *Demography*, 48(1), 1–23.
- Marks, G. N. (2013): "Education, social background and cognitive ability: The decline of the social." Routledge, New York.
- Markussen, S., and K. Røed (2017): "Egalitarianism under Pressure: Toward Lower Economic Mobility in the Knowledge Economy?," IZA Discussion Papers 10664, Institute for the Study of Labor (IZA).
- Mayer, S. E., and L. M. Lopoo (2008): "Government Spending and Intergenerational Mobility," *Journal of Public Economics*, 92(1), 139 – 158.
- Mazumder, B. (2016): Estimating the Intergenerational Elasticity and Rank Association in the United States: Overcoming the Current Limitations of Tax Data. vol. 43 of Book Series: Research in Labor Economics, chap. 3, pp. 83–129. Emerald Group Publishing Limited.
- Mazumder, B., and J. Davis (2016): "The Decline in Intergenerational Mobility After 1980," Discussion paper, mimeo, Federal Reserve Bank of Chicago.
- Meghir, C., and M. Palme (2005): "Educational Reform, Ability, and Family Background," *American Economic Review*, 95(1), 414–424.
- Mocetti, S. (2007): "Intergenerational Earnings Mobility in Italy," *The B.E. Journal of Economic Analysis & Policy*, 7(2), Article 5.
- Modalsli, J. (2015): "Intergenerational Mobility in Norway, 1865-2011," Discussion papers, Statistics Norway, Research Department.

- Munshi, K. (2011): "Strength in Numbers: Networks as a Solution to Occupational Traps," *Review of Economic Studies*, 78(3), 1069–1101.
- Neidhöfer, G., J. Serrano, and L. Gasparini (2017): "Educational Inequality and Intergenerational Mobility in Latin America: A New Database," CEDLAS, Working Papers 0215, CEDLAS, Universidad Nacional de La Plata.
- Neidhöfer, G., and M. Stockhausen (forthcoming): "Dynastic Inequality Compared: Multigenerational Mobility in the United States, the United Kingdom, and Germany," *Review of Income and Wealth*.
- Nicoletti, C., and J. Ermisch (2007): "Intergenerational Earnings Mobility: Changes across Cohorts in Britain," *The B.E. Journal of Economic Analysis & Policy*, 7(2), Article 9.
- Nybom, M., and J. Stuhler (2017): "Biases in Standard Measures of Intergenerational Income Dependence," *Journal of Human Resources*, 52(3), 800–825.
- Oreopoulos, P., and M. E. Page (2006): "The Intergenerational Effects of Compulsory Schooling," *Journal of Labor Economics*, 24(4), 729–760.
- Pekkala, S., and R. E. B. Lucas (2007): "Differences across Cohorts in Finnish Intergenerational Income Mobility," *Industrial Relations: A Journal of Economy and Society*, 46(1), 81–111.
- Pekkarinen, T., K. G. Salvanes, and M. Sarvimäki (forthcoming): "The Evolution of Social Mobility. Norway over the 20th Century," *Scandinavian Journal of Economics*.
- Pekkarinen, T., R. Uusitalo, and S. Kerr (2009): "School Tracking and Intergenerational Income Mobility: Evidence from the Finnish Comprehensive School Reform," *Journal of Public Economics*, 93(7-8), 965–973.
- Piopiunik, M. (2014): "Intergenerational Transmission of Education and Mediating Channels: Evidence from a Compulsory Schooling Reform in Germany," *Scandinavian Journal of Economics*, 116(3), 878–907.
- Piraino, P. (2007): "Comparable Estimates of Intergenerational Income Mobility in Italy," *The B.E. Journal of Economic Analysis & Policy*, 7(2), Article 1.
- Raaum, O., B. Bratsberg, K. Røed, E. Österbacka, T. Eriksson, M. Jäntti, and R. Naylor, (2007): "Marital Sorting, Household Labor Supply, and Intergenerational Earnings Mobility across Countries," *The B.E. Journal of Economic Analysis & Policy*, 7(2), Article 7.
- Rauh, C. (2017): "Voting, education, and the Great Gatsby Curve," *Journal of Public Economics*, 146(C), 1–14.
- Rauh, C., and T. Boneva (forthcoming): "Parental Beliefs about Returns to Educational Investments The Later the Better?," *Journal of European Economic Association*.
- Restuccia, D., and C. Urrutia (2004): "Intergenerational Persistence of Earnings: The Role of Early and College Education," *The American Economic Review*, 94(5), pp. 1354–1378.
- Ruggles, S., C. Fitch, and M. Sobek (2017): "Building a National Longitudinal Research Infrastructure," MPC Working Paper No. 2017-2.
- Shavit, Y., and H.-P. Blossfeld (1993): *Persistent Inequality: Changing Educational Attainment in Thirteen Countries*. Westview Press.
- Solis, A. (2017): "Credit Access and College Enrollment," *Journal of Political Economy*, 125(2), 562–622.
- Solon, G. (1992): "Intergenerational Income Mobility in the United States," *American Economic Review*, 82(3), 393–408.

- (1999): "Intergenerational Mobility in the Labor Market," in *Handbook of Labor Economics*, ed. by O. Ashenfelter, and D. Card, vol. 3A, chap. 29, pp. 1761–1800. Elsevier.
- (2004): "A Model of Intergenerational Mobility Variation over Time and Place," *Generational Income Mobility in North America and Europe*, pp. 38–47.
- Solon, G., M. Corcoran, G. Gordon, and D. Laren (1991): "A Longitudinal Analysis of Sibling Correlations in Economic Status," *Journal of Human Resources*, 26(3), 509–534.
- Stuhler, J. (2012): "Mobility Across Multiple Generations: The Iterated Regression Fallacy," IZA Discussion Papers 7072, Institute for the Study of Labor (IZA).
- Treiman, D. J., and H. B. Ganzeboom (1990): "Cross-national Comparative Status Attainment Research," in *Research in Social Stratification and Mobility*. Citeseer.
- Turkheimer, E. (2000): "Three Laws of Behavior Genetics and What They Mean," *Current Directions in Psychological Science*, 9(5), 160–164.
- Vogel, T. (2006): "Reassessing Intergenerational Mobility in Germany and the United States: The Impact of Differences in Lifecycle Earnings Patterns," SFB 649 Discussion Papers 2006055, Sonderforschungsbereich 649, Humboldt University, Berlin, Germany.
- Vosters, K., and M. Nybom (2017): "Intergenerational Persistence in Latent Socioeconomic Status: Evidence from Sweden," *Journal of Labor Economics*, 35(3), 869–901.

GETTING IN TOUCH WITH THE EU

In person

All over the European Union there are hundreds of Europe Direct information centres. You can find the address of the centre nearest you at: https://europa.eu/european-union/contact_en

On the phone or by email

Europe Direct is a service that answers your questions about the European Union. You can contact this service:

- by freephone: 00 800 6 7 8 9 10 11 (certain operators may charge for these calls),
- at the following standard number: +32 22999696, or
- by electronic mail via: https://europa.eu/european-union/contact_en

FINDING INFORMATION ABOUT THE EU

Online

Information about the European Union in all the official languages of the EU is available on the Europa website at: https://europa.eu/european-union/index_en

EU publications

You can download or order free and priced EU publications from EU Bookshop at:

<https://publications.europa.eu/en/publications>. Multiple copies of free publications may be obtained by contacting Europe Direct or your local information centre (see https://europa.eu/european-union/contact_en).

The European Commission's science and knowledge service

Joint Research Centre

JRC Mission

As the science and knowledge service of the European Commission, the Joint Research Centre's mission is to support EU policies with independent evidence throughout the whole policy cycle.



EU Science Hub

ec.europa.eu/jrc



@EU_ScienceHub



EU Science Hub - Joint Research Centre



Joint Research Centre



EU Science Hub

