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The Intergenerational Transmission of Poverty in Industrialized Countries

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**Stephen P. Jenkins
Thomas Siedler**

**The Intergenerational Transmission of Poverty in
Industrialized Countries**

Berlin, May 2007

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**The intergenerational transmission of poverty
in industrialized countries**

Berlin, May 2007

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Abstract

This paper reviews research about the intergenerational transmission of poverty in industrialized countries. In order to make our survey manageable, we restrict attention to studies that consider the relationship between parental poverty (or ‘income’) during childhood and later-life outcomes; we do not explicitly consider the impact of other family background variables such as parental education. The general message is that growing up poor has a deleterious impact on later-life chances, and that this impact is not wholly explained by other factors that are themselves correlated with childhood poverty. At the same time, the studies also show that one should be cautious about drawing more specific conclusions. For example, the degree of intergenerational persistence appears to vary depending on the definition of the outcome variable, and different estimation methods provide a range of estimates. In addition, most of research about intergenerational links has been undertaken using US data, and it is not clear that any specific conclusions should carry over to another country with very different social norms and institutions including e.g. differences in labour market regulation, and in systems of education and social security benefits. However we conclude that, broadly speaking, the analytical framework that has been used for high-income countries can also be applied to low-income countries.

Keywords: Poverty, intergenerational transmission, mobility, family background, income, industrialized countries

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0 Executive Summary

- There is widespread concern that material disadvantage is transmitted across generations from parents to children. Researching the impacts on later-life outcomes of childhood poverty, and childhood family income more generally, is particularly important because income is one thing that governments can change relatively easily by altering the parameters of their social assistance and social insurance schemes.
- A positive correlation between the incomes of parents and children does not imply that differences in parental income necessarily cause the differences in children's income: other factors (e.g. parental education or some unobserved factor like 'ability') may drive each of them.
- In order to make our survey manageable, we restrict attention to studies that consider the relationship between parental poverty (or 'income') during childhood and later-life outcomes; we do not explicitly report the impact of other family background variables such as parental education.
- A variety of definitions of economic status during childhood has been used in previous research, and classifications of studies according to the measure used provide the means by which we organize our review of research. Sections 2 and 3 consider studies using a categorical measure of poverty status as the family background variable. Sections 4 and 5 consider studies with income itself as the family background variable. In Section 6, welfare benefit receipt is the corresponding variable.
- Once one takes account of the other potential factors besides parental income (or poverty) that may play a role in the intergenerational transmission process, the association between income (or poverty) and later-life outcomes is reduced, but typically does not disappear.
- The causal impact of parental income (or poverty) is not so clear cut, however, if one takes account of factors in the transmission process that are unobserved in data sets, or more intrinsically unobservable (e.g. 'ability'), and which are also correlated with childhood family income. 'Instrumental variable' estimators, and use of data from children who have been adopted are among the main approaches that have been used in this case. The evidence about whether parental income has a causal effect is somewhat mixed.

- We conclude that, in industrialised countries, growing up poor is negatively correlated with later-life chances, and that this relationship appears not to be wholly explained by other factors that are themselves correlated with childhood poverty.
- At the same time, the studies also show that one should be cautious about drawing more specific conclusions. For example, the degree of intergenerational persistence appears to vary depending on the definition of the outcome variable, and different estimation methods provide a range of estimates. In addition, most of research about intergenerational links has been undertaken using US data, and it is not clear that any specific conclusions should carry over to another country with very different social norms, market development, and institutions including e.g. differences in labour market regulation, and in systems of education and social security benefits.
- For precisely the same reason, we expect the nature of the intergenerational transmission process to differ in low-income countries from that in high-income countries, and for there to be heterogeneity among the former, just as there is among the latter.
- Nonetheless, we submit that much the same analytical framework can be employed to formulate hypotheses in low-income countries as for high-income countries. Indeed, the ‘family investment’ perspective on the intergenerational transmission process has already been applied in a range of countries. The crucial cross-national differences are likely to be more concerned with matters of detail such as the definition of particular measures rather than the formulation of general hypotheses.

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1 Introduction

The impact of poverty during childhood on economic well-being and other attainments later in life is a major concern in many industrialized countries and a topic of active research. There is concern that poor children become poor adults – that material disadvantage is transmitted across generations from parents to children. Researching the impacts of childhood poverty, and childhood family income more generally, is particularly important because income is one thing that governments can change relatively easily by altering the parameters of their social assistance and social insurance schemes. Other potential drivers of later-life attainments such as experience of life in a lone parent family during childhood are harder for policy-makers to influence.

This paper reviews recent research for industrialized countries. Most of the research to date on intergenerational mobility in general – and persistence of poverty across generations in particular – has used data for the USA. Studies for other countries are not numerous and, to the best of our knowledge, there exists no survey of the intergenerational transmission process with a particular emphasis on industrialized countries other than the USA. This study fills this gap and complements earlier surveys such as those by Corcoran (1995), Haveman and Wolfe (1995), Mayer (2002), Solon (2002) and Kamerman *et al.* (2003). For surveys of the methods used in intergenerational studies, see our companion paper (Jenkins and Siedler 2007), and the references therein. The paper should also be read in conjunction with the complementary CPRC study by Behrman (2006).

A large body of research has found that, compared to children from more affluent families, children from low-income families turn out to be disadvantaged in many dimensions. On average, they have lower birth weight (Currie and Hyson 1999), higher risk of infant mortality (Bonnie *et al.* 1999), more behaviour problems (Duncan *et al.* 1994), are less successful in school (Haveman and Wolfe 1995; Blanden and Gregg 2004), do worse in the labour market (Gregg and Machin 2000; Mayer 2002), and have inferior health (Case *et al.* 2002; Currie *et al.* 2004). And these outcomes are all ones that are associated with income later in life.

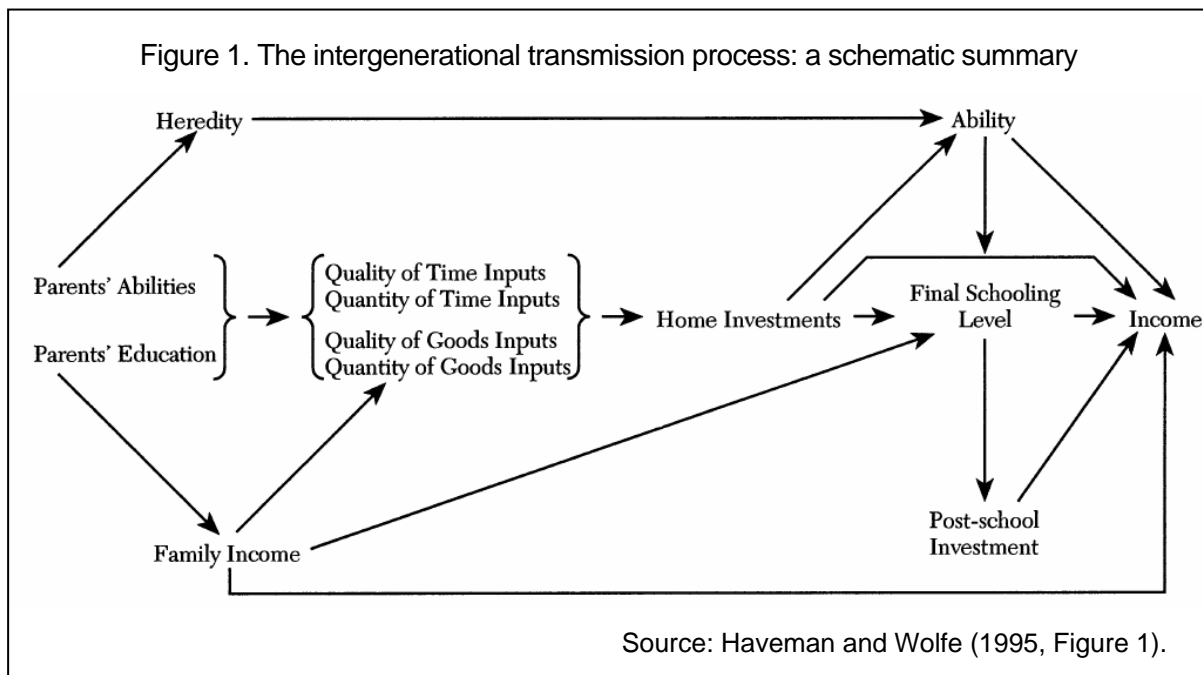
Correlations do not necessarily imply causation, however: the patterns cited may not reflect a direct causal effect of childhood family income. Outcomes and family income may both be determined, at least in part, by other unobserved individual or family characteristics, e.g.

genetic make-up and related concepts such as ‘ability’, and environmental factors related to where individuals live, e.g. their neighbourhood, housing, and schools. Children from poor families are more likely to face adverse home environments, to live in deprived neighbourhoods and to go to lower quality schools than do their better off peers, and these factors may be primarily responsible for the differences in attainments rather than low income. Hence, it is not an easy task to determine whether it is really family income which is the driving force underlying observed intergenerational relationships. So, a second contribution of this survey is to pay particular attention to recent studies aiming at estimating causal effects of family income during childhood and adolescence on children’s outcomes later in life.

To help illustrate the points made so far, and to provide an organising device for the rest of the paper, we provide a schematic summary of the intergenerational transmission process in Figure 1 (overleaf). This shows the principal causal pathways from running from family background (the left hand side of the picture) to children’s attainments later in life and income in particular (on the right hand side of the picture).

Income is determined by schooling and post-school investments (for example on-the-job training) and ability; employment status is implicitly part of income. Educational achievement depends on ability, family income and home investments. Ability is determined by (genetic) heredity and home investments. Central to the intergenerational transmission process are home investments, generated by the combination of parents’ time and purchased goods and services. Families differ in their capacities to make home investments, because of imperfections in the market for human capital. Better-off parents can spend more on their children, whether on better child care, food, housing or more books, supporting them in further and higher education, and so on. Regardless of family income, differences in parental abilities and education also matter for home investments in a number of ways. For example, they may lead to differences in children’s attitudes to learning and their aspirations, in parental capacities to help children learn, and in parenting skills in general.

Clearly the intergenerational transmission of poverty is a complex process to unravel, even in the simplified world represented by Figure 1. And there are various aspects that are omitted. For example, physical and financial assets may also be transferred between generations, and affect outcomes directly (i.e. not only through the income that they generate) e.g. by relaxing



borrowing constraints in human capital investment markets. Also absent from the picture are transfers, from the government through the income maintenance system, and between families of the same generation.

The way in which ‘poverty’ and ‘income’ are defined is central to a survey such as this one. Three main definitions have been used, for measures of both outcome (child’s generation) and family background variables. First, there are binary measures of poverty status, with an individual being defined as poor if s/he has a family income below a low income cut-off (the ‘poverty line’), and zero otherwise. Second, there are continuous measures of income. Many of these adjust income for differences in household size and composition, e.g. total family money income normalised by the poverty line for the family (the ‘poverty ratio’), or total money income divided by an equivalence scale that accounts for differences in needs (equivalized income). Third, and less commonly, researchers have used categorical measures of income or other transformations of income. If (adjusted) income is used as an explanatory variable, the implicit assumption is that an additional £1 of income has the same effect for the rich as well as for the poor. But it may be that increments to family income are more impor-

tant the lower that income is. In order to investigate these non-linear effects, Corcoran and Adams (1997), for example, distinguished nine different income-to-needs groups of individuals, including a distinction between individuals from ‘very poor’ and ‘poor’ families. Issues of timing also matter for the definition of poverty concerns. For example, is childhood poverty defined as being poor in one year, during the entire childhood, or during early or late childhood years?

It should be observed that all the definitions of ‘income’ referred to so far concern money income, and not full income, i.e. the combined resources available from money and time. The model sketched in Figure 1 refers to both time and money, but cites them separately rather than combining them into a single measure of resources. In this review, we are concerned specifically with the impact of money income and of low income in particular.

Classifications of studies according to types of measure used provide the means by which we have organised our review of research. Section 2 considers studies in which binary measures of poverty status were used as the outcome variable and as an explanatory variable. In Sections 3 and 4, we survey studies in which the outcome variables refer to factors associated with income rather than income or poverty status per se. In Section 3, the family background variable refers to childhood poverty; in Section 4, it refers to childhood family income. The socio-economic outcomes considered are educational attainment, health status, and labour market achievement. (Since the major aim of this study is to survey the literature about the association between childhood poverty and poverty when an adult, we do not review studies of the effect of family income on developmental outcomes measured during childhood. For studies investigating relationships between childhood poverty and early childhood development see Duncan *et al.* (1994) and references therein). Section 5 reviews recent studies of intergenerational mobility. Section 6 focuses on welfare benefit receipt, another measure of low income status. The final section provides concluding remarks, including an assessment of the extent to which the findings for industrialized countries may also apply to low income countries.

Throughout the paper, our principal means of summarizing a large body of research is to use tables that classify studies under a number of headings, e.g. definitions of the outcome measures and key findings. (The tables are collected together at the end of the paper.) The main text provides a brief commentary on the tables.

Before proceeding to our review, we note several issues of interpretation raised by Mayer (2002) in the context of these studies. The first issue concerns the situation when researchers compare the life chances of individuals who grew up poor with those who grew up in more affluent families using models in which the income-outcome relationship is assumed to be linear. The estimated effect is therefore an average for rich and poor families and, if the relationship is in fact non-linear, estimates may under-estimate the benefits of raising the income of poor families. In addition, many researchers do not report the average childhood household income for poor and non-poor individuals separately, which makes interpretation of results difficult. Thus, it has to be kept in mind that many of the studies that we survey are not particularly informative about *how much* one would have to increase family income during childhood in order to reduce an individual's chances of being poor when an adult.

A second issue is that measures based on ratios of income to needs may confound the impacts of the experience of poverty per se with the effects of different family size and composition. 'Needs' are measured using these variables, and they may have a separate impact on later-life outcomes, and their effect may vary across outcomes. Mayer (2002: 19) points out that '[s]ubstituting the poverty ratio for parental income will exaggerate the importance of income for some outcomes, because the estimate will be inflated by the inclusion of the family size effect. In other cases, the opposite will happen.'

A third issue is that some studies investigate the persistence of poverty across generations using measures of poverty status that are based on a single year of income information only. Family income observed for one year during childhood might be a poor proxy for income at other times, because incomes might vary substantially during childhood (in a manner that parents cannot easily account for by borrowing and smoothing consumption). Thus the timing of poverty within childhood may matter. A different critique of the use of one-year snapshot measures of income and poverty status is that they may be susceptible to measurement error and transitory variations, in which case their use may lead to biased estimates. If income is averaged over time, these errors and variations may be smoothed away. Many studies have found that using measures of household income averaged over several years increases the estimate of the intergenerational correlation of income (Solon 1992).

2 The intergenerational inheritance of poverty

We begin with studies of the intergenerational persistence in poverty: see Table 1 for a summary. Most of what is known concerns the USA, and there are few up-to-date studies for other countries. Since poverty status is a categorical variable, the pattern of intergenerational persistence is often summarized using transition tables (Corcoran 2001; Corcoran and Adams 1997; Blandon and Gibbons 2006). Poverty transition tables allow us to compare the chances of being poor when an adult for those individuals who experienced poverty during childhood, with the chances of being poor for those who did not experience poverty during childhood.

Corcoran (2001), for example, found considerable differences in the persistence of poverty between African American and whites. Using data from the US Panel Study of Income Dynamics (PSID), she reports that more than 30 percent of African American who grew up poor during late childhood (aged 16–17) lived in poverty as young adults. The corresponding proportion for white American young adults was around 7 percent. Similarly, Corcoran and Adams (1997) also found greater persistence of poverty across generations among black Americans than among whites. They also distinguished between respondents who were ‘short-term’ poor (poor for up to half the years observed) and those persistently poor (poor more than half the years observed), applying such distinctions to both childhood and adulthood. Black young adults who grew up in poor families were found to be 2.5 times more likely to be persistently poor compared to black young adults who did not grow up poor.

Blanden and Gregg (2006) report poverty transition tables for the UK. They found that, whereas 19 percent of men who experienced poverty at age 16 in the mid-1970s were also poor as young adults, only 10 percent of adult men who were not poor at age 16 were poor as young adults. The corresponding figures for women were 29 percent and 17 percent.

Blanden and Gregg (2006) also considered whether the intergenerational persistence of poverty had changed over time using data from two British cohort surveys: the first following children born in March 1958 and the second following children born in April 1970. In the first survey, all the respondents were adolescents in the early 1970s; in the second, the respondents were adolescents in the 1980s. Blanden and Gregg argued that the association between being poor when a teenager and being poor when a young adult rose between the two surveys, after having made a number of robustness checks to account for potential problems arising from their survey measures of income. A contrasting picture for the UK is provided by Ermisch

and Nicoletti (2005) who, referring to earnings rather than income, argue that ‘there are no strong changes in intergenerational mobility across cohorts from 1950 to 1972’ (2005: 27).

Airio *et al.* (2004) investigated the intergenerational correlation of poverty, but for Finland. They considered whether there were differences in the association before and after the recession during the 1990s. Finns who grew up poor were found to be around two times more likely to be poor as adults than those who grew up non-poor, but ‘the transmission of poverty did not change during the depression: those coming from a poor childhood family had the same poverty risk before and after the depression’ (2004: 19). Musick and Mare (2004) compared two US cohorts who grew up in the 1960s and 1970s, finding no evidence of changes in intergenerational association of poverty over time.

Taken together, the studies cited so far suggest that there is persistence of poverty across generations, with individuals who experienced poverty during childhood and adolescence more likely to be poor as adults compared to those who did not grow up poor. But are these associations driven by other family background characteristics?

One of the first studies that attempted to separate the effect of growing up poor from other potentially important family background and environment characteristics was Corcoran and Adams (1997). The authors found that the association between poverty during childhood and adulthood decreased by almost 40 percent once they controlled for other family background variables such as mother’s years of schooling, head of household’s average work hours, whether ever lived in a female-headed household and various neighbourhood characteristics. However, the degree of intergenerational poverty persistence remained large and statistically significant, suggesting that experience of poverty during childhood might have a direct effect on later-life outcomes.

Blanden and Gregg (2006) also examined the extent to which family background characteristics were mediating channels for the intergenerational persistence of poverty, using two UK birth cohort surveys (as mentioned above). Once the authors had controlled for potential mediating factors such as parents’ employment and schooling, social housing, absence of father in the household and number of siblings, they found no statistically significant association between the experience of poverty when a teenager in the 1970s and poverty when aged in the early thirties. By contrast, for those who grew up poor in the 1980s, poverty appeared to have detrimental long-term effects over and above the impact of various family background characteristics.

Both Corcoran and Adams (1997) and Blanden and Gregg (2004) found that individuals with better-educated parents were less likely to be poor themselves: schooling played a crucial role in the intergenerational transmission process (cf. Figure 1).

3 Childhood poverty and socio-economic outcomes later in life

In this section, we review studies examining the extent to which childhood poverty is associated with individual's educational attainment, health and labour market outcomes. Because of the difficulties of collecting information about income for individuals both during adulthood and childhood (see Jenkins and Siedler 2007), studies of the intergenerational transmission of poverty have often used measures other than income that are known to be correlated with income. These outcomes are also of interest in their own right, of course. (There are more studies of this kind than of those with measures of poverty status for two generations.)

One such outcome measure is educational attainment (see e.g. Duncan *et al.* 1998), since education is widely considered to be one of the primary drivers of labour market success. On average, individuals with higher levels of education have higher labour market earnings, employment rates, are less likely to be unemployed, and less likely to receive various welfare benefits (Ashenfelter and Ham 1979; Harris 1996; Meghir and Palme 2005). Because there is considerable evidence of a strong correlation between health and success in the labour market, we also survey studies of the association between growing up poor and an individual's health later in life. The relationship between household income and children's health is important since health might be one transmission channel for the intergenerational link of income and education (Case *et al.* 2005; Doyle *et al.* 2005). For instance, it is well known that there exist a negative association between mental health problems and labour market outcomes (Kessler *et al.* 2004). Furthermore, it is established that poor health in childhood is related to poor health as adults (Case *et al.* 2005). Finally, we report results from a few studies investigating links between experiencing poverty during childhood and labour market outcomes later in life, in particular wage rates and labour market experience.

The majority of studies surveyed in this section used data from household panel surveys in which children were followed from childhood to late adolescence or early adulthood when the outcomes were measured. The studies attempt to unravel the various contributions of factors such as growing up poor, experiencing poverty at different childhood stages and over different time periods, controlling for measures of parental background such as educational qualifications, and (where possible) measures of housing quality and neighbourhood, experience of lone parenthood and maternal employment during childhood, and so on.

Table 2 summarizes studies of the effect of childhood poverty on children's educational attainment, health and labour market outcomes, in several dimensions. The main findings of these studies may be summarised as follows. Growing up poor is associated with a broad range of socio-economic outcome variables, but the strength of the association varies from one outcome to another. Several studies have found that childhood poverty or low parental income is correlated with a lower chance of graduating from high school, fewer years of schooling and lower college attendance (Haveman and Wolfe 1994; Duncan *et al.* 1994; Duncan *et al.* 1998; Haveman *et al.* 1997). In addition, for men, childhood poverty is associated with lower labour supply, annual earnings, household income and hourly wages (Corcoran and Adams 1994; Haveman and Wolfe 1994; Corcoran 1995).

A few studies have contrasted the impacts on later-life outcomes of being poor for a relatively short time or a relatively long time during childhood. Most studies report that having lived many years in poverty during childhood is more negatively associated with later life outcomes than shorter periods of childhood poverty (Haveman *et al.* 1997; Korenman and Miller 1997; Teachman *et al.* 1997). Children who experienced poverty for a greater number of years attend school for fewer years, are more likely to drop out of school, and have lower wages. See, for example, Haveman *et al.* (1997) and Teachman *et al.* (1997).

A related question is whether the timing of childhood poverty matters. The leading study of this issue was by Duncan *et al.* (1998). They found that being poor when a young child (ages 0–5) seemed to have a larger association with educational outcomes than being poor later in childhood. This might be because fewer resources at early age may impede the cognitive development of children. Note, however, that the existence and magnitude of this time effect was not so clear for other outcomes.

4 Childhood family income and socio-economic outcomes later in life

We now turn our attention to studies investigating associations between parental income and children's later life outcomes. Again, most of the evidence available refers to the USA. However, with the growing availability of longitudinal data in industrialized countries, empirical evidence has emerged in recent years for a number of other nations. See e.g. Maurin (2002) for France, Jenkins and Schluter (2002) for Germany, Maloney (2004) for New Zealand, and Björklund *et al* (2004) for Sweden. Table 3 summarizes the relevant studies.

Several findings are common to most of the studies. First, family income averaged over several years is more strongly correlated with children's outcomes, both in early childhood and later in life, than family income observed in a single-year only (Behrman and Taubman 1990; Solon 1992; Zimmerman 1992). Second, having higher income during childhood is positively associated with outcomes, but the effects are small in absolute terms and small relative to the effects of other factors associated with differences in outcomes, e.g. race and parental education. In addition, the estimated association decreases once mediating factors, such as parental education are controlled for (Blanden and Gibbons 2006). Third, and more generally, a given change in income has a bigger impact on the outcomes of children from poor families than for children of rich families (Duncan *et al.* 1998; Duncan and Brooks-Gunn 1997). In addition, effects vary by child outcome: for example, 'family income has much stronger associations with achievement and ability-related outcomes ... than with measures of health and behavior' (Duncan *et al.* 1998: 420). Researchers such as Mayer (2002) state, however, that the robustness of these findings has yet to be established. After all, the number of studies about each of the issues remains relatively small.

A few recent studies have examined associations between childhood family income and child health (Currie and Hyson 1999; Case *et al.* 2002, Currie *et al.*, 2004; Graham and Power 2004). Most studies examine the intergenerational impact on outcomes measured at a relatively young age, children aged 0–15, i.e. younger than in the other studies discussed so far. There seems to be a significant and increasing positive effect of parental income on health with children's age in the United States and Canada (Case *et al.* 2002; Currie and Stabile 2003) but not in the United Kingdom (Currie *et al.* 2004). Currie and her co-authors argue that the absence in the UK of a positive parental income gradient on children's health with increasing

age might be explained by the National Health Service better succeeding in assuring better health for children of low income parents.

The overwhelming majority of studies estimating the relationship of income with children's outcomes control for observed parental characteristics that are likely to affect both parental income and children's outcomes later in life. However, it is almost impossible to control for all of the characteristics that influence both parental income and child outcomes. Therefore, one concern with most studies surveyed so far is that estimated intergenerational effects may reflect the impacts of unobserved parental traits (e.g. parents' ability, motivation, temperament) which influence both family income and children's outcomes later in life.

In the remainder of this section, we pay particular attention to studies that aim to control for unobserved family factors, and thereby to estimate causal effects (conditional, of course, on the assumptions made that permit their identification). We focus on two different approaches applied in the literature. The first strand uses explanatory variables ('instruments') that capture exogenous variations in family income (Mayer 1997; Shea 2000; Acemoglu and Pischke 2001; Dahl and Lochner 2005; Chevalier *et al.* 2005). (See also our companion paper, Jenkins and Siedler 2007.) A second strand of the literature uses data about adopted children to estimate causal effects of parental income on later-life outcomes (Sacerdote 2002; Björklund *et al.* 2004). The idea of the instrumental variable approach is that, by construction, the instrumental variable is highly correlated with parents' income, once all the other explanatory variables have been netted out, and must not have any direct influence on children's income other than through parents' income. For example, Shea (2000) used father's union status, average industry wage premium and involuntary job loss due to firm closure as exogenous variation for parental income. For estimates on adoptee samples to have good properties, a number of assumptions need to hold. First, one needs to assume that adopted children are randomly assigned to adoptive parents. Second, parents do not differentiate between their natural and adopted children, treating them equally in terms of the time and money spent on them. Third, environmental characteristics such as treatment and behaviour of teachers and child-minders are assumed not to differ systematically between adopted and natural children.

A variety of measures of exogenous variation in family income have been used. Mayer (1997) was among the first to shed light on causal effects of family income on later-life outcomes. She used several instruments for family income during childhood: parental income after children's outcomes were measured, variations in family income due to differences in welfare

rules, and changes in income inequality. The idea behind the first instrument is that increases in future family income (assuming they are unanticipated) represent a kind of windfall gain that may be treated as exogenous and hence constitute a valid instrument for past family income. Using this approach with US PSID data, Mayer (1997) found little evidence for a causal effect running from family income to each of a number of outcomes. However, to be a valid instrument, future income growth must be orthogonal to unobserved individual characteristics, such as ability, motivation and intelligence and, arguably, this is unlikely to be the case.

Shea (2000) used as instruments for family income changes associated with a father's job loss following plant closures, and also union and industry wage differentials. He argued that these variables capture changes in income due to 'luck' and represent therefore exogenous variation in family income. According to Shea's estimates from the PSID based on observed family income, there was a positive and statistically significant association between family income and later-life outcomes. However, when he used the instruments to control for endogeneity of family income, he found no statistically significant impact of childhood family income on educational outcomes.

Chevalier *et al.* (2004) applied Shea's methods to UK data, using father's union status as an instrument for parental income. They also controlled for the potential endogeneity of parents' education by using increases in the minimum school leaving age over time as an instrument. According to the estimates that did not control for endogeneity, the authors found positive correlation between parental income and the probability of post-compulsory schooling for respondents aged 16–18. But when endogeneity was accounted for, Chevalier and his co-authors found an even stronger effect of parental income on outcomes. Their results suggest that increases in parental income may help to overcome credit constraints at around the time children reach the minimum school leaving age, and thereby increase the proportion of individuals who go on to further education. However, it is questionable whether father's union status constitutes a valid instrument in the two previous studies. Father's union status reflects paternal choice, and may well be related to unobservable heritable factors such as risk aversion or ability which could directly influence children's later-life outcomes.

Dahl and Lochner (2005) exploited variations in family income due to changes over time in the US Earned Income Tax Credit. They found that family income had a positive and statistically significant impact on math and reading test scores. Acemoglu and Pischke (2001) used changes in the distribution of family income over time in the United States during the 1970s

and 1980s as an instrument for family income, and found large effects on college enrolment. For instance, they report that a 10 percent increase in family income was associated with a 1.4 percentage point increase in the probability of attending a four-year college.

Doyle *et al.* (2005) were among the first that investigated whether parental income has a causal effect on the health of children (aged 0–15). As in earlier studies, the authors found a positive association between parental income and children's health using pooled waves from the 1997–2002 Health Surveys of England. However, when they accounted for potential endogeneity of both parents' income and education, Doyle *et al.* found no evidence of a causal effect of parental income. This suggests that positive association between parents' income and children's health arises from unobservable characteristics that influence both variables and, hence, increasing family income would not necessarily improve children's health.

A second line of research uses data about adopted children to estimate the causal effects of family income on later-life outcomes. For the USA, Sacerdote (2002) found a positive and statistically significant effect of parental income for natural children. For adoptees, the estimate was also positive but not statistically significant (which may have been due to small sample sizes).

Björklund *et al.* (2004) analyzed later-life outcomes for adopted and natural children using data from the Swedish population register, with a large sample – 7,500 adopted children aged 26 and above. They found that both the degree of intergenerational persistence in earnings and income was considerable lower for adoptees than for natural children, but the effects were positive and statistically significant nonetheless.

5 Intergenerational income mobility

There is a large and growing literature on intergenerational mobility for many industrialized countries. The overwhelming majority of studies focus on individual earnings rather than on individual's household income and so cannot tell us directly about the intergenerational inheritance of poverty. In addition, most studies provide estimates of an average intergenerational association: the degree of persistence is assumed to be the same for everyone, rich or poor. In particular this describes the large number of studies that summarize the degree of mobility in terms of the elasticity of an individual's earnings (or income) with respect to father's earnings, deriving the estimate using an OLS regression of log son's earnings on log father's earnings. However, one might expect that the degree of intergenerational mobility might vary depending on how well off one's parents were, in which case 'average' estimates are of little use for telling us about persistence for those who grew up in low-income families. For example, the effect of income during childhood on later-life earnings might be larger for those from relatively poor families compared to those with relatively affluent parents.

Because of the limitations of 'average' estimates for our current purposes, we do not survey the intergenerational literature as whole: see Solon (2002) and Corak (2006). Instead, we focus on intergenerational mobility studies that allowed the degree of intergenerational persistence to vary with parental earnings and income, and we pay particular attention to income effects for children with fathers in the bottom of the income distribution.

Several studies have reported transition matrices showing the chances of achieving different earnings decile group destinations depending on decile group origins defined in terms of fathers' earnings origin. See e.g. Dearden *et al.* (1997), Corak and Heisz (1999), Couch and Lillard (2004) and Peters (1992)). All these studies show that the intergenerational earnings correlation differs according to an individual's father's earnings decile group. For example, for the USA, Zimmerman (1992) found higher upward mobility from the bottom of the distribution compared to downward mobility of the top. Dearden *et al.* (1997) reported similar results for the UK.

Quantile regression methods provide another method for examining nonlinearities in intergenerational mobility (Eide and Showalter 1999). Whereas the OLS regressions cited in the last paragraph provide a single 'average' persistence estimate, quantile regressions allow the

estimated elasticity to vary at different points of the income distribution. Eide and Showalter found that the levels of intergenerational mobility were lowest for sons with fathers' income at the bottom of income distribution (more precisely, the 5th percentile). In one of the most recent and comprehensive studies, Jäntti *et al.* (2006) compared intergenerational mobility in Denmark, Finland, Norway, Sweden, UK and USA. The authors report that intergenerational income mobility is highest in Nordic countries, lower in the UK and lowest in the USA among men. For women, the authors report that differences across countries are much smaller, but the ordering of countries in terms of the degree of intergenerational mobility remains broadly similar to that of men. Jäntti *et al.* (2006) also examined intergenerational mobility at different points of father's earnings distribution using transition matrices. Their results suggest that cross-country differences in persistence arise mainly from differences in mobility from the tails of father's income distribution. When considering adult sons whose fathers were in the poorest fifth, it was apparent that upward mobility is lowest in the USA. Slightly more than 40 percent of men in the USA born to low-income fathers remained in the bottom of the income distribution whereas, for the Nordic countries, the proportions were in the range 0.25–0.28, and the proportion was 0.30 for the UK. Differences between the Nordic countries and the UK were largely explained by the lower downward mobility from the very top to the bottom of the income distribution in the UK.

6 Intergenerational transmission of welfare benefit receipt

In this section, we survey the literature on intergenerational transmission of welfare receipt in various countries. Welfare receipt and being poor are closely linked since the majority of welfare recipients live in poor households. Thus, an alternative way of studying generational links of poverty is by exploring intergenerational transmission of welfare receipt. Again, research with US data is the most extensive: see Gottschalk (1996), Pepper (2000), and Page (2004). Only a very few studies have investigated the intergenerational transmission of welfare receipt in other countries: Corak *et al.* (2004) for Canada and Sweden, Stenberg (2000) for Sweden and Siedler (2006) for Germany.

There are several reasons why an intergenerational transmission of welfare receipt might exist. First, parental welfare benefit receipt may lower children's distaste for welfare benefit receipt and reduce stigma costs (Moffitt 1983). Second, sons and daughters from welfare recipient households might learn how the benefit system 'works' and so be more likely to make a successful claim, other things being equal. The effects of learning and of lower stigma are both likely to lower the (monetary and non-monetary) costs of receipt. Third, children whose parents were welfare recipients might have fewer informal means of finding a job because of their parents' lower labour market participation and, therefore, might have fewer chances of finding jobs and of being successful in the labour market compared to individuals whose family did not receive welfare benefits during childhood. Related arguments with similar implications have been proposed by non-economists too. For example, Mead (1992) argued that welfare receipt influenced the behaviour, norms and values of both parents and children, and resulted in an intergenerational persistence of poverty. Murray (1984) criticised American welfare programs on the grounds that welfare support created disincentives to be employed and led to a culture of poverty.

The majority of US studies have focused on the main welfare benefit in that country, Aid For Families with Dependent Children (AFDC), a programme whose participants were almost all lone mothers (and most of whom were African American rather than white). The studies investigated the effect on the probability of her daughter's AFDC receipt of growing up with a mother who had been an AFDC recipient. The main findings of the literature are as follows. First, there exists a positive relationship between daughters' and mothers' AFDC receipt: see

McLanahan (1988), Solon *et al.* (1988), and Gottschalk (1990). Second, those daughters are also expected to receive benefit for a longer time (Antel 1992; Pepper 2000). Third, there is no consensus whether children from welfare families score lower on cognitive test scores or not (Hill and O'Neill 1994; Peters and Mullis 1997; Levine and Zimmerman, 2004). Fourth, a daughter whose parent(s) received welfare at some point during her childhood ends up with fewer years of schooling (Hill and Duncan 1987; Butler 1990), and lower chances of high school graduation (Corcoran *et al.* 1992; Corcoran and Adams 1993). Fifth, mothers' AFDC receipt is found to have no influence on children's birth weight and on prenatal care (Currie and Cole 1993). Finally, sons from 'welfare families' work fewer hours, have significant lower earnings, hourly wage rates and family income (Corcoran *et al.* 1992).

The majority of studies estimated the degree of persistence in receipt using parametric models that assume that parental welfare receipt is exogenous, i.e. they assume that any unobserved determinants of welfare benefit receipt are uncorrelated with any unobserved determinants of parental welfare benefit receipt. If this assumption is inappropriate, estimates of persistence may be biased. Gottschalk (1996) investigated whether there exists a causal link between mothers' and daughters' welfare receipt, or whether the association is driven by other factors which are unobservable to the researcher. His argument was that only mother's past welfare participation can cause daughter's welfare participation today, but not mother's future welfare participation. Hence he used future maternal welfare participation as a proxy for whether intergenerational association is driven by unobservable characteristics. He found a positive causal intergenerational association in AFDC receipt for non-black daughters and, to a lesser extent, for black daughters. Pepper (2000) used the local unemployment rate in the county of residence when daughters were aged twelve as an instrument for parental AFDC receipt. The idea is that variation in local labour market conditions corresponds to exogenous variation in parental welfare benefit receipt. He reported that his results 'are consistent with the notion that growing up in a household that receives welfare substantially increase the likelihood of future welfare dependence, but the results are also consistent with the interpretation that the effect is negligible or even, in certain cases, substantially negative' (Pepper 2000: 487).

7 Conclusions

The general message from the studies reviewed for industrialized countries is that growing up poor is associated with having worse later-life chances, and that this association is not wholly explained by other factors that are themselves correlated with childhood poverty. There is some evidence that some of this relationship may be causal, but substantively small nonetheless (Mayer 2002). At the same time, the studies also show that one should be cautious about drawing more specific conclusions. For example, the degree of intergenerational persistence appears to vary depending on the definition of the outcome variable, and different estimation methods provide a range of estimates. In addition, most of research about intergenerational links has been undertaken using US data, and it is not clear that any specific conclusions should carry over to another country at a different level of economic development, with different institutions including e.g. differences in labour market regulation, and in systems of education, health, and social security benefits (in terms of coverage and generosity), and with different social norms. For precisely the same reason, we would expect that the nature of the intergenerational transition process to differ in low-income countries from that in industrialized countries, and also for there to be heterogeneity with the former group as well as the latter – what happens in a sub-Saharan African country is likely to differ from what happens in a South Asian one. Let us elaborate several aspects of this.

The nature of poverty differs between rich countries and poor countries. In Europe today, poverty policy – at least as addressed by the European Union – is more concerned with issues of social exclusion and participation in the society in which people belong. By contrast; in developing countries, poverty is much more of a subsistence notion. (These differences are reflected in the choice of poverty lines in each context by researchers and in official statistical monitoring.) These differences mean that not only is the nature of the outcome variable different in low- and high-income countries, but so too is the potential impact on it of ‘poverty’ experienced during childhood. In terms of Figure 1, the nature and strengths of the different pathways from (and to) ‘family income’ on the left hand side of the chart may be different. For example, in low income countries, differences in family income may have a much critical impact on whether a child secures sufficient food or has access to health care or schooling. The proportions of individuals who have different levels of primary, secondary, and tertiary education differs between low- and high-income countries, which may have substantial differences in terms of the distribution of rates of return to education.

In a more fundamental sense, Figure 1 may need to be modified for thinking about intergenerational transmission processes in low-income countries. The chart implicitly assumes that children grow up in two-generation household and form their own household after education. In many low-income countries, it is more common for several generations of the same household to live together. The extended family may provide an additional source of resources (e.g. child care from a grandmother) or additional costs that reduce the resources available to children (e.g. caring for infirm elderly relatives). The number of children is greater in many low income countries than in most industrialized countries, which has implications both for how far a given family income will go, and for the generation of income for the family. Older children may work in the household (e.g. provide child care, or work on a family plot), or work for pay in a labour market. In a number of countries too, where the HIV/AIDS epidemic has had a substantial effect, the nature and extent of familial support for children has been profoundly affected.

What, then, are the implications of our study for the formulation of hypotheses about the intergenerational transmission of poverty in low income countries? Our main conclusion is that much the same analytical framework can be employed in this context as for developing countries.

Although we have pointed out that organising perspectives like Figure 1 may need some modification in the low income context, the same fundamental ideas are surely important. In short, a person's family background is likely to have crucial impacts on his or her later-life socio-economic achievement, regardless of the level of development of the country within which they live. Indeed, the 'family investment' perspective encapsulated in Figure 1 has already been widely applied in low- and middle-income countries as well as high-income countries. Indeed, arguably the role of families in the intergenerational process is likely to be greater in developing countries than in industrialized countries, because markets and institutionalized social protection may be less extensive in the former relative to the latter. (Ben-Porath (1980) and Pollak (1985), discussing transaction costs approaches, show how the role of the family may change with the level of a country's development.)

The crucial cross-national difference, we submit, is therefore not so much to do with the formulation of hypotheses of a general nature, but in the very detail of the application and this, in turn, has important implications for the specific measures in intergenerational data sets.

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Table 1. Studies of the intergenerational association in poverty

Country Study	Data and Sample	Time period	Estimation methods	Definition of being poor	Outcomes	Key results
United States						
Corcoran and Adams (1997)	PSID: children aged 5-15 in 1968 and aged 25-35 in 1988 with at least three years observed as a child and at least one year observed as head or wife in own household when aged 25 or older	Outcomes: aged 25-35 in 1988; determinants: Parents' income were measured when child was aged 4-16	OLS, logistic	Ratio of family income to the Census Bureau poverty line is less than one.	(1) Never poor; (2) Being ever poor as adult (poor in at least one year); (3) Persistent poverty during adulthood (poor in at least half the years observed in panel as adult)	White men and black Americans who have grown up poor are found to have much lower income-to-needs ratios and higher risk of being poor as an adult. Authors find evidence of non-linear effects of income-to-needs ratio on poverty status as adult. Persistence of poverty over time is stronger the longer individuals were poor during childhood years. Blacks were more likely to be poor than non-blacks and women had also a higher risk to be poor as an adult compared to men.
Corcoran (1995)	PSID: children aged 7-15 in 1968 and aged 27-35 in 1988	Outcomes: aged 27-35 in 1988	Cross-tabulations	Ratio of family income to needs-ratio, averaged over the years (childhood and adulthood) is less than one.	(1) Never poor; (2) Poor in 1-50 percent of all years observed as adult (3) Poor in 51-100 percent of years observed as adult	Black children who grew up in poverty are 2-5 times more likely to be poor as young adults compared to blacks who were not raised in poor families. The corresponding figure for whites is 7.5. Long-time poverty during childhood is found to be particularly harmful for black children.
Corcoran (2001)	PSID: children aged 1-15 in 1968	Outcomes: aged 25-27 between 1981-1993; determinants: aged 15-17 between 1968-1985	Cross-tabulations	Ratio of family income to the Census Bureau poverty line, averaged over three years during teens, is less than one	Being poor is defined if the ratio of his or her family income to the census poverty line averaged over ages 25-27 is less than one	Poor children are more likely to be poor as adults compared to non-poor children. Intergenerational transition of poverty is particularly strong for African American children.
Musick and Mare	NLSYW: 1,157	1968-1988;	Log linear	Average household	Being poor is defined as if	Stronger intergenerational trans-

Country Study	Data and Sample	Time period	Estimation methods	Definition of being poor	Outcomes	Key results
(2004)	daughters aged 14-18 in 1968; NLSY: 1,552 daughters aged 14-18 in 1979	1979-2000		income over three years is below the average poverty threshold; single motherhood	the average household income over three years is below the average poverty threshold; single motherhood	mission of poverty compared to family structure. Children who grow up poor are 3.5 times more likely to live in poverty in adulthood. Comparing intergenerational mobility across two cohorts who grow up in the 1960s and 1970s, the authors find no evidence of changes in intergenerational mobility of poverty over time in the US.
United Kingdom						
Blanden and Gibbons (2006)	NCDS: 2,243 daughters and 2,272 sons born in a week in March 1958; BCS: 2,403 daughters and 2,133 sons born in a week in April 1970	Outcomes: aged 33 in 1991 and aged 42 in 2000 (NCDS); aged 30 in 2000 (BCS); determinants: aged 16 in 1974 (NCDS), aged 16 in 1986 (BCS)	Crosstabulations, logit, ordered logit	Equivalentised household income at age 16 is below 60% of median equivalent household income. (Median for the population)	Being poor is defined if 'equivalised' household income is below 60% of median income in the population, before housing costs.	Children who are poor as teenagers (aged 16) are more likely to be poor as adults (aged 33 and aged 42 using the NCDS and aged 30 using the BCS). The link between child poverty and poverty later in adult life has risen over time: the association is stronger for teenagers in the 1980s compared with teenagers in the 1970s.
Finland						
Airio <i>et al.</i> (2004)	LCDF of Statistics Finland: 5,855 children born in 1960	Outcomes: 1990 and 1995; determinants: time when person was aged 10	Log linear	Equivalentised household income below 50% of median (gross) equivalent household income threshold. (Median calculated only for families in which a respondent was 10 years old)	Being poor at ages 30 and 35 (those whose income was below 50 percent of median equivalent (gross) income)	Evidence of intergenerational transmission of poverty. Individuals who grow up in a poor family have around two times higher risk to be poor as young adults compared to those who grow up in non-poor families.

Notes: If a study used samples of various sizes, we report the largest sample size. For a glossary of survey name acronyms, see the Appendix.

Table 2. Studies of the association between childhood poverty and later life outcomes

Country Study	Data Set and Sample	Time period	Estimation methods	Definition of poverty during childhood	Outcomes	Key results
United States						
Duncan <i>et al.</i> (1998)	PSID: 1,323 children born between 1967 and 1973 and present in the panel between birth and age 20; 328 sibling pairs	Outcomes: aged 25 or later; determinants: ages 0-15	OLS, sibling differences	Income used is total pre-tax income of all family members, inflated to 1993 prices.	Years of completed schooling; high school completion	Positive effect of family income on years of completed schooling and high school completion. Income effects were larger for children from low-income families than for children who grew up with more affluent parents. Family income during early childhood (0-5) had a stronger association with years of schooling than did family income during middle and late childhood.
Haveman <i>et al.</i> (1997)	PSID: 1,705 children aged 0-6 in 1968 and followed over 20 years	Outcomes: 1988	Probit	Being poor at least one year during ages 6-15; Being poor all years aged 6-15	High school graduation (if respondent had 12 or more years of education)	Both family income and poverty during childhood are associated with high school graduation. In particular the length of time spent in poverty as a child is negatively correlated with educational success. Increase in parental income from less than the poverty line to one and two times the poverty line decreases children's risk to drop out of high school by one percentage point.

Country Study	Data Set and Sample	Time period	Estimation methods	Definition of poverty during childhood	Outcomes	Key results
Korenman and Miller (1997)	NLSY: 1,698 children aged 5-7 and born between 1979-1988 to mothers aged 14-25 in 1979	Outcomes: 1986, 1988, 1990; determinants: 1978-1990	OLS, logit, cousins' differences	<p>Poverty is defined in terms of income-to-needs ratio. Four categories for poverty duration: (1) never poor; (2) always poor (poor in all years income information was available), (3) poor in some years and (4) missing duration status (fewer than five years of income information available)</p> <p>Four categories with respect to timing of poverty: (1) Poor early (ages 0-2), not late; (2) Poor late (age 3-assessment years), not early; (3) poor early and late; (4) not poor</p>	Low height-for-age (defined as height below the 10 th percentile for children of the same sex and age), low weight-for-height (child's weight was below the 10 th percentile for children of the same height and sex), indicator of nutritional status and motor and social development (MSD)	Poverty is negatively linked with health and development in early childhood, but not to nutritional status. However, authors find huge variations across outcomes, model specifications and sub-samples to "make precise quantitative statements". Largest effect is found for association between long term poverty and low-height-for age outcome. Authors find evidence for non-linear effects of family income on various outcome measures.
Peters and Mullis (1997)	NLSY: 1,908 children aged 14-15 by January 1, 1979 not living by their own or institution	Outcomes: aged 24-25	OLS	Dichotomous poverty measure (poor/non-poor); income-to-needs measure average over three years; non-linear effects of poverty by distinguishing seven poverty groups by average income-to-needs ratio (1) 0.0-0.5; (2) 0.5-1.0; (3) 1.0-1.5; (4) 1.5-2.0; (5) 2.0-2.5; (6) 2.5-3.0; (7) >3.0	Completed schooling by 1989, wage rate and labour market experience by 1990	Authors find a linear effect of income on most outcomes. No differences are found between children who lived in poverty during some years and those who lived in poverty during all years.
Teachman <i>et al.</i> (1997)	NLS: 1,594 children aged 14-15 in the base survey year	Outcomes: aged 25+; determinants: ages 14/15 – 17/18	Logit	Distinguish between: (1) Being poor during adolescence for 1-3 years; (2) being poor 4 years. Uses two definitions of poverty: (1) being poor if household income before taxes is below	High school completion, college attendance, years of schooling attained	Authors report a stronger relationship between poverty when measured in terms of income-to-needs ration than poverty defined in terms of income threshold. Young people who had lived in

Country Study	Data Set and Sample	Time period	Estimation methods	Definition of poverty during childhood	Outcomes	Key results
				the income threshold for families of the same size. (2) income-to-needs ratio, (3) non-linear effects of poverty by distinguishing four poverty groups by average income-to-needs ratio: (1) less than 1.0; (2) 1.0-2.0; (3) 2.0-3.0; (4) and more than 3 times poverty		poverty during their adolescence were less likely to graduate from high school, completed fewer years of schooling and our found to be less likely to attend college. Associations are stronger for those who have spent 4 years in poverty compared to those who were 1-3 years poor during adolescence. Poverty has a larger effect on high school graduation than college attendance.
United Kingdom						
Ermisch <i>et al.</i> (2001)	BHPS: 1,787 children born between 1970 and 1983 and who could be matched with their parents in the panel study. BYP: 1,647 children born between 1979 and 1988	1991-1999	OLS, sibling differences	Poverty in terms of low income (net family income is below 60 percent of the median household income); poverty measured in terms of parents' worklessness (parental worklessness occurs when both parents were not in paid work for at least one month in each of the first sixteen years of life of the child). Authors distinguished between current and persistent poverty.	Highest educational attainment; economic inactivity; health (psychological distress)	BYP: Experience of poverty during late childhood (ages 11-15) reduces chances of children's educational attainment (measures as achieving a good number of GCSEs with high grades) and staying on at school after age 16. BHPS: Sons who grew up poor have around 10 percent lower chance of achieving A-level or higher qualifications compared to sons from wealthier families. Both sons and daughters who experienced poverty during childhood have higher chance of economic inactivity later in life. Poverty has no clear impact with children's health.

Country Study	Data Set and Sample	Time period	Estimation methods	Definition of poverty during childhood	Outcomes	Key results
Canada Lipman and Offord (1997)	OCHS: 2,277 children aged 4-12 in 1983 and aged 8-16 in 1987	Outcomes: ages 4-12 in 1983 and ages 8-16 in 1987; determinants: 1983, 1987	OLS	Poverty: Distinguished four groups by average income-to-needs ratio. Less than 1; 1-2, 2-3; >3 Poverty duration: Distinguished between: (1) sometimes poor (either in 1983 or 1987) or always poor (income-to-needs ratio of less than 1 in both years)	School outcome (4 categories: Failed and full-time remedial education, failed only, full-time remedial only, neither); Schoolwork (5 point scale ranging from "Not well at all" to "Very well/excellent"), Psychiatric disorder (number of symptoms); Social impairment (number of difficulties in getting along with parents, teachers and peers); Chronic health problems (number of symptoms)	Income below the Statistics Canada low-income cut-off is significantly positive associated with academic and psychiatric difficulties. Poverty experience early in child's life is correlated with schooling difficulties.

Note. For a glossary of survey name acronyms, see the Appendix.

Table 3. Studies of the impact of childhood family income on education, health and labour market outcomes

Country Study	Data Set and Sample	Time period	Estimation methods	Outcomes	Key results
United States					
Mayer (1997)	PSID: 4,003 children NLSY: around 2,900 children aged 4-7 in 1986, 1988, or 1990	Outcomes: 1989; determinants: 1972-1976 Outcomes: 1986, 1988 and 1990; determinants: 1982-1986	OLS; IV	Dropping out of high school; years of education; years of education for high school graduates, male workers' hourly wages and annual earnings	OLS estimates suggest that doubling parental income decreases high school drop out rates by 13 percentage points, increases years of education by more than half a year and raises male wages by 20 percent. However, estimation methods which account for endogeneity of family income find no significant relationship.
Acemoglu and Pischke (2001)	NLS-72; HSB; NELS	Outcomes: 1972, 1980, 1982 and 1992; determinants: when the respondent was in senior year in high school	OLS, IV	Attending any college, attending four-year college within two years of high school	Large effects of family income on college enrolment. For instance, a 10 percent increase in family income increases the probability of attending a four-year college by 1.4 percentage points.
Shea (2000)	PSID: 3,033 children	Outcomes: 1976-1992	OLS; IV	Wages, labour earnings, total income and years of schooling	Positive association of family income with outcomes. However, using IV strategy, changes in family income show no causal effect on children's human capital. Parents' income has a positive effect on children in families has less than 12 years of schooling.
Levy and Duncan (2000)	PSID: 1,836 children and 863 children in the sibling sample observed between birth and at least age 20 using panel waves 1968-1996	Outcomes: 1989-1996; determinants: 1969-1992	OLS; Sibling differences	Completed years of schooling at age 20	Parental income has a positive impact but the magnitude of the effect is small. For example, increasing family income by 10,000\$ annually for the first 15 childhood years increases years of schooling by around one-fifth of a year. The authors find that in particular family income during early childhood (ages 0-4) has a positive effect on schooling.

Country Study	Data Set and Sample	Time period	Estimation methods	Outcomes	Key results
Case <i>et al.</i> (2002)	NHIS and NHIS-CH: 229,330 children aged 0-17; PSID and PSID-CDS: 2,950 children aged 0-12; NHANES: 10,018 children aged 0-16	1987-1995; 1997; 1988-1994	Ordered probit, OLS	Subjective health status; Parent-assessed health status; physician-assessed health status; days spent in bed; restricted activity days; absent from school; hospitalisation; reports by doctors, chronic health conditions	Positive significant association of parental income with children's health. Differences in the health of children from wealthier and poorer children become more pronounced with age.
United Kingdom					
Doyle <i>et al.</i> (2005)	HSE: 7,005 children aged 0-15; with both parents included in the survey.	1997-2002	Ordered probit; OLS; IV	Subjective health responses for children aged 13-15 and reported by parents for children < 13	Find positive association between parental income and children's health. However, the authors find neither evidence of a causal relationship nor evidence of a significant parental income gradient in child health with increasing age of the child.
Chevalier <i>et al.</i> (2005)	LFS: 9,456 children aged 16-18 living with both their parents and parents are born in the UK after 1933	Outcomes: 1993-2003	OLS, IV	Participation in post-compulsory schooling, achievement of five or more GCSE passing grades	Positive association between paternal income and children's schooling outcomes. When controlling for potential endogeneity of both parents' education and income, the estimates point to a stronger relationship between family income and children's education compared to conventional OLS estimates.
Currie <i>et al.</i> (2004)	HSE: 13,745 children aged 0-15 in England;	1997-2002;	Ordered probit; probit;	Subjective health status; chronic health conditions, nurse measurements; blood test results;	Positive association between family income and subjective health status, but not with health measures based on nurse measurements and blood test results. No evidence that effect is larger for older than young children.
Canada					
Currie and Stabile (2003)	NLSCY: 14,169 children aged 0-11 surveyed in all three surveys 1994, 1996 and 1998	Outcomes and determinants: 1994, 1996 and 1998	Ordered probit; OLS	Subjective health status, ever been diagnosed with chronic conditions, hospitalisation at any point in the last year, limitation in types of activity	In line with Case <i>et al.</i> (2002), the authors find that health of children from low-income families became worse with age because they are subject to more health shocks than children from families with higher income.

Country Study	Data Set and Sample	Time period	Estimation methods	Outcomes	Key results
France					
Maurin (2002)	EPCV: 592 children born in 1985 and 1986	Outcomes: 1997	OLS, GMM	Held back in elementary school	Large impact of family income on the probability of being held back in elementary school. Increasing parental income by 10 percent is associated with a 6.5 percentage point decrease in the probability of being held back in elementary school.
Germany					
Jenkins and Schluter (2002)	SOEP: 522 children born between 1980–84	Outcomes: aged 14; Determinants: 1983-1996	Ordered probit	Type of secondary school attended	Association between schooling and late-childhood income is stronger compared to early-childhood income. Income effects are relatively small and linear.
New Zealand					
Maloney (2004)	CHDS: 797 children aged 21,	Outcomes: aged 21; determinants: ages 1-14	Probit,	Economic inactivity (ages 16-21); no school or post-school qualification by age 21	Association between family income and various outcomes for children later in life become insignificant once mediating factors (such as scores on intelligence tests administered at ages 8-9 and scores on conduct problem assessments by parents and teachers) are controlled for.
Sweden					
Björklund <i>et al.</i> (2004)	SPR: 8,309 children adopted by both parents and born in Sweden in 1962-1973	Outcomes: 1990; parental income and earnings for 1970, 1975, 1980, 1985 and 1990	OLS	Years of schooling, college education, log earnings in 1999, log income in 1999	Significant positive impact of parental earnings on children's earnings and education.

Notes. For a glossary of survey name acronyms, see the Appendix.

Table 4. Studies of non-linear patterns of intergenerational mobility

Country Study	Data Set and Sample	Time period	Estimation methods	Outcomes	Key results
United States					
Eide and Showalter (1999)	PSID: 612 sons aged 25-34 in 1987; HSB: 5,409 sons aged 23-31 in 1990	PSID: Outcomes: 1984-1991; determinants: 1968-1970; HSB: Outcomes: 1987-1992; determinants: 1980	OLS and quantile regressions	PSID: Log average earnings in the period 1984-1991; HSB: Log average earnings in the period 1987-1992	Intergenerational association is strongest at the bottom of son's conditional earnings distribution. Including years of schooling decreases intergenerational relationship in earnings by as much as 50 percent, suggesting that education is an important determinant in the intergenerational association of earnings.
Canada					
Corak and Heisz (1999)	IID: 389,348 sons aged 16-19 in 1982 and who filed an income tax return at some point between 1982-1986	Outcomes: 1993-1995; determinants: 1978-1982	Quartile, decile and percentile transition matrices, nearest-neighbourhood estimations (locally weighted least square regressions),	Earnings and total market income	Intergenerational mobility is highest in the middle of the income distribution and lower in the tails. Income mobility yields in comparable results, but is considerably lower at the very top of the income distribution.
Grawe (2004)	IID: 53,390 sons aged 16-19 in 1982 with fathers born between 1908-1952	Outcomes: 1978-1982; determinants: 1994-1998	Quantile regression	Log average earnings over a five-year window conditional on observing positive values in each year	S-shaped intergenerational relationship in earnings below median of son's earnings distribution and convexity above the median.
Germany					
Couch and Lillard (2004)	NLS: 1,694 sons SOEP: 657 sons using panel years 1985-1998	Outcomes: NLS: Earnings reported between ages of 18-65; SOEP: Earnings reported between ages of 18-60	OLS; OLS by father's earnings quintile	Earnings	Authors find that the average elasticity between earnings of fathers' and sons' are of equal magnitude in Germany and the US. In both countries, intergenerational elasticity of earnings varies across father's income distribution. Intergenerational association is strongest at the top of father's income distribution in both countries.

Note. For a glossary of survey name acronyms, see the Appendix.

Table 5. Studies of the intergenerational transmission of welfare benefit receipt

Country Study	Data Set and Sample	Time period	Estimation methods	Outcomes	Key results
United States					
Duncan <i>et al.</i> (1988)	PSID: 1,085 daughters aged 21-23 in 1976	Outcomes: aged 21-23; determinants: Child aged 13-15	Cross-tabulations	Receipt of AFDC in (1) 1-2 years; (2) all three years, (3) no AFDC receipt	Higher incidence of welfare receipt (both outcomes (1) and (2)) among daughters whose parents' were welfare recipients.
Gottschalk (1992)	NLSY: XY daughters aged 14-19 in 1979	Outcomes: 1979;	Discrete time, competing risk logistic	(1) Receipt of AFDC in the year of first birth; (2) first birth and no AFDC in year of birth; (3) no birth	Positive intergenerational correlation between mothers' welfare receipt and daughters' likelihood to have a child and receiving AFDC in the year of first birth.
Antel (1992)	NLSY: 2,430 daughters aged 14-19 in 1979	Outcomes: 1985-1987; determinants: 1978	Two-stage tobit	Number of months of welfare receipt	Positive effect of mother's welfare receipt on daughter's welfare receipt.
An <i>et al.</i> (1993)	PSID: 892 daughters aged 19-25 in 1987	Outcomes: 1987; determinants: daughters aged 6-15	Bivariate probit	Teenage childbirth, ages 13-18 and AFDC receipt in any of the three years after giving birth as a teenager	Daughter's whose mothers received welfare are more likely to give birth out of wedlock and become welfare recipient themselves.
Gottschalk (1996)	PSID: 357 black daughters and 402 non-black daughters aged 23-28 in 1988	Outcomes: 1988; determinants: 1968-1988	Discrete time, competing risk, logistic (controlling for unobserved heterogeneity by including mother's future AFDC participation and by modelling heterogeneity via a mixing distribution)	(1) No birth; (2) Giving birth and receipt of AFDC in the same year (same and following years); (3) Giving birth and no AFDC receipt in the year of birth (same and following years)	Positive causal intergenerational effect of AFCD receipt for non-black daughters and, to a lesser extent, for black daughters.
Pepper (2000)	PSID: 1,205 daughters aged 24-33 in 1989	Outcomes: 1984-1988; determinants: 1973-1977	Tobit with exogenous selection; various nonparametric bounding methods, instrumental variable	(1) Expected duration of number of months daughters receipt AFDC; (2) probability to receive any AFDC; (3) probability	Conclusions rest on assumptions reader is willing to impose. Data alone is not conclusive. However, all alternative estimation methods are in line with the inference that growing up in a house-

				of receiving AFDC for more than 2 years	hold with AFDC receipt increases the length of time a daughter will receive welfare as an adult.
Page (2004)	PSID: 1,899 daughters aged 27-42 in 1993 who became HoH or wives of a HoH	Outcomes: Ages 27-42 who became HoH or wives of HoH; determinants: 1968 – and the year in which daughter left home	Probit	Household received AFDC, General Assistance, Food Stamps, or SSI	Positive intergenerational correlation in welfare participation. The correlation is considerably influenced by the length of the observation window and age at which respondent's potential welfare receipt is observed.
Canada					
Corak <i>et al.</i> (2004)	Longitudinal administrative data matched with income tax system: 6,308 sons born between 1963-1966 and aged 15-31 in 1978-1997	Outcomes: 1978-1997; determinants: 1978-1997	Logistic; random effects probit	Number of years since age 15 until first UI receipt; UI receipt over time	Sons whose fathers received SA in the past begin their first UI claim earlier and are more likely of repeated UI receipt.
Sweden					
Stenberg (2000)	Project Metropolitan, cohort study of the entire population born in 1953 in Stockholm: 12,012 daughters and son	Outcomes: 1982-1983; determinants: 1953-1972	Logit	Means-tested SA receipt	Positive intergenerational correlation between parents' SA receipt and that of their children.
Corak <i>et al.</i> (2004)	Panel data built using a one percent sample from the Register of Total Population: 3,835 sons born between 1963-1966 and aged 15-29 in 1978-1995	Outcomes: 1978-1995; determinants: 1978-1995	Logistic (controlling for unobserved heterogeneity by including future parental UI receipt); random effects probit	Number of years since age 15 until first UI receipt; UI receipt over time	No causal evidence is found that young men whose fathers collected UI in the past are more likely to claim UI sooner. However, once the first UI receipt happened, individuals are more likely to claim benefit again.

Notes: In case studies used various sample sizes, we report the largest sample size. For a glossary of survey name acronyms, see the Appendix. AFDC: Aid to Families with Dependent Children program; UI: Unemployment insurance; SA: Social assistance; SSI: Supplemental Security Income; HoH: head of household.

Appendix. Glossary of survey name acronyms , by country

United States

CNLSY:	Child Supplement to National Longitudinal Survey of Youth
NLSYW:	National Longitudinal Surveys of Young Women
NLSY:	National Longitudinal Survey of Youth
NHIS:	National Health Interview Survey
NHIS-CH:	1988 Child Health supplement to the National Health Interview Survey
PSID-CDS:	1997 Child Development Supplement to the Panel Study of Income Dynamics
NHANES:	Third National Health and Nutrition Examination Survey
WLS:	Wisconsin Longitudinal Study
NLS-72:	National Longitudinal Study of the High School Class of 1972
HSB:	High School and Beyond Survey
NELS:	National Educational Longitudinal Study
NLSCY:	National Survey of Children and Youth
NLS-72:	National Longitudinal Study of the High School Class of 1972
PSID:	Panel Study of Income Dynamics

Great Britain

BHPS:	British Household Panel Survey
BYP:	British Youth Panel (part of the British Household Panel Survey)
HSE:	Health Survey for England
LFS:	UK Labour Force Survey

France

EPCV:	Enquête Permanente sur les Conditions de Vie des Ménages
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Canada

NLSCY:	National Longitudinal Survey of Children and Youth
IID:	Canadian Intergenerational Income Data

Sweden

SPR:	Swedish Population Register
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Germany

SOEP:	Socio-Economic Panel Survey
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